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taken from the library.

AN ULTRAVIOLET MULTIPLET TABLE

The Spectra of Molybdenum, Technetium, Ruthenium,
Rhodium, Palladium, Silver, Cadmium, Indium, Tin, Anti-
mony, Tellurium, Iodine, Xenon, Cesium, Barium,
Lanthanum; Hafnium, Tantalum, Tungsten, Rhenium,
Osmium, Iridium, Platinum, Gold, Mercury, Thallium,
Lead, Bismuth, Polonium, Radon, and Radium



Circular 488, Section 3

UNITED STATES DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS

The National Bureau of Standards Circular series was discontinued in July 1959 with the inauguration of the NBS Monograph series. However, since the first two Sections of Circular 488 were published before 1959, the Circular designation is being retained for the remaining three Sections of this Circular.

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By CHARLOTTE E. MOORE



Circular of the National Bureau of Standards 488, Section 3

Issued April 6, 1962

Foreword

The present Section of NBS Circular 488, *An Ultraviolet Multiplet Table*, is the third of a series that has been prepared in connection with the program on Atomic Energy Levels in progress at the National Bureau of Standards. This Section contains the leading multiplets of 78 spectra of 31 elements in the range from molybdenum through lanthanum ($Z = 42$ to 57), and hafnium through radium ($Z = 72$ to 88). It parallels Volume III of NBS Circular 467, *Atomic Energy Levels*, which was published in 1958.

Circular 488 in its entirety provides an ultraviolet multiplet table covering the periodic chart of the elements except for the two groups of rare-earth elements, $Z = 58$ to 71 and $Z = 90$ to 103. These groups will be treated separately when the observation, description, and analyses of rare-earth spectra in various stages of ionization have been carried further.

Section 1 of an *Ultraviolet Multiplet Table*, issued in 1950, includes multiplets of 79 spectra of the first 23 elements in the periodic table, hydrogen through vanadium. Section 2, issued in 1952, contains multiplets of 46 spectra of the elements chromium through niobium. Section 4 is a finding list containing all lines in Sections 1 and 2 listed in order of wavelength; Section 5 is a similar finding list for the present Section and will conclude the series.

This program could not have been brought to its present stage of completion without the cordial collaboration of many spectroscopists, both in the Bureau and in other laboratories at home and abroad. Their interest and support are gratefully acknowledged.

A. V. ASTIN, *Director*.

WASHINGTON, D. C., *September 15, 1961*.

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		Mo II -----	3			Ba II -----	58
		Mo III -----	9	Lanthanum	57	La I -----	59
		Mo IV -----	9			La II -----	59
		Mo V -----	10			La III -----	60
						• • • • •	
Technetium	43	Tc I -----	12	Hafnium	72	Hf I -----	61
		Tc II -----	12			Hf II -----	61
Ruthenium	44	Ru I -----	13	Tantalum	73	Ta I -----	63
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		Pd II -----	32	Osmium	76	Os I -----	74
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Silver	47	Ag I -----	37	Iridium	77	Ir I -----	77
		Ag II -----	37	Platinum	78	Pt I -----	78
		Ag III -----	39			Pt II -----	78
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		Cd II -----	40			Au II -----	81
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Tin	50	Sn I -----	46			Tl II -----	87
		Sn II -----	46	Lead	82	Pb I -----	88
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		Sn V -----	48	Bismuth	83	Bi I -----	90
Antimony	51	Sb I -----	49			Bi II -----	90
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Xenon	54	Xe I -----	55				
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		Xe III -----	56				
Cesium	55	Cs I -----	57				
		Cs II -----	57				

1. Arrangement

The present Section is a continuation of the ultraviolet multiplet table, arranged similarly to Sections 1 and 2, which were published in 1950 and 1952, respectively. Most of the lines listed are short of 3000 Å. Only a limited number of multiplets are included for a given spectrum. These have been selected on the basis of anticipated astrophysical importance and also of possible importance in spectrochemical analysis. No attempt has been made to include all known multiplets of all known spectra.

The heading for each spectrum includes the ionization potential, a grade indicating the present state of the analysis, a grade indicating roughly how many of the known multiplets are listed, and the date of completion of the manuscript. The grades A, B, C, etc., indicate respective decrease in completeness. For example, Grade A, List A denotes that the spectrum is well analyzed and that all known classified lines are listed.

For consistency, the excitation and ionization potentials

have been obtained, as before, by using the multiplication factor 0.00012345 to convert energy levels and limits in cm^{-1} to electron volts. The revised conversion factor 0.00012395¹ has been used in deriving the ionization potentials in "Atomic Energy Levels", and is preferable for future work.

Following the bibliographies are letters denoting the reference sources used for the tabular data, and indicating also, the general content of the reference. These letters have the following meaning:

I P	Ionization potential
W L	Wavelength
I	Intensity
(I)	Intensity from a different reference than is denoted by "I"
T	Term analysis
CL	Classified lines
Z E	Zeeman effect

2. Symbols

The symbols have, in general, the same meaning as in Sections 1 and 2. They are as follows:

* denotes a blend. If an asterisk precedes the wavelength and no symbol follows the wavelength, the line is blended with another in the same spectrum.

§ follows a wavelength (with an asterisk always preceding), to denote that the line is blended with one in a neighboring spectrum of the same element, i.e. first and second spectra, second and third spectra, etc. of a given element.

§§ special symbols following the wavelength (with an asterisk always preceding) used for blends not described by the above symbols. They are explained below the references for a given spectrum.

‡ follows the wavelength of the *raie ultime* for first and

second spectra as given by Meggers² or taken from later analyses.

¹ a special note regarding the excitation potentials of Mo III and Tc II.

† follows the multiplet designation to indicate that not all of the lines observed in the multiplet are listed here.

[] wavelengths in brackets represent forbidden transitions.

"m" precedes the wavelength when the line is masked. The predicted position of the line is given, as indicated by the letter "P" in the reference column; the masking spectrum is indicated in the intensity column.

The letters in the intensity column have the usual meanings. These are summarized in the general notation recommended for the description of spectral lines³.

3. Acknowledgments

This work has been greatly enhanced in value because of the cordial collaboration of spectroscopists throughout the world. Within this Bureau W. F. Meggers has generously furnished unpublished data for several spectra (Tc I, Tc II, Sb II, Hf I, Hf II, Pb I). C. C. Kiess has, also, willingly contributed in advance of publication, extensive monographs on highly complex spectra (Mo I, Ta I, Ta II). M. M. Harvey (Mo I); C. H. Corliss and W. R. Bozman (Tc I, Tc II); and H. K. Kiess (Ta I) have assisted with analyses.

A. G. Shenstone at Princeton University has supported the program continuously and furnished a number of manu-

scripts for use here (Ru III, Pd I, Pd III, Sn I, Sn II, Sn III, Sn IV, Sn V).

F. R. Rico and the late M. A. Catalán have advanced material on Tc II and Rh II. Unpublished data on Ir I from the late W. Albertson have been utilized. Other material has come from R. Nodwell (In III); M. Bernarda Handrup and J. S. Ross (Te II); D. D. Laun (W I, W II); and J. N. P. Hume and M. F. Crawford (Pb III).

Many details of compilation have been handled most skillfully by Mrs. Isabel D. Murray. The writer is also especially indebted to J. E. Carpenter for special consultation and to Mrs. Betty L. Arnold whose competence in handling the publication details has been invaluable. She wishes to record here not only her sincere thanks but also the pleasure she has experienced from the cooperation of all who have so generously contributed to this extensive project.

¹ See Trans. Joint Commission for Spectroscopy, J. Opt. Soc. Am. 43, 412 (1952).

² W. F. Meggers, J. Opt. Soc. Am. 31, 44 (1941), first spectra; ibid. 31, 606 (1941), second spectra.

³ See Trans. Joint Commission for Spectroscopy, J. Opt. Soc. Am. 43, 423 (1952).

Mo I

MOLYBDENUM, $Z = 42$

IP 7.07 Anal A List C October 1960

REFERENCE

A C. C. Kiess and M. M. Harvey, unpublished material (1960). W L, I, T

Mo I

Mo I

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Air							Air						
2944.214	A	8	0.00	4.19	3-3	$a^7S - y^5P^\circ$	2834.784	A	10	1.41	5.77	2-1	$a^5D - 7^\circ$
3002.197	A	20	0.00	4.11	3-2	(1)	2809.94	A	10	1.38	5.77	1-1	(14)
2225.437	A	65R	0.00	5.55	3-3	$a^7S - y^3D^\circ$	2796.052	A	8	1.35	5.77	0-1	
						(2)	2850.776	A	10	1.46	5.79	3-3	$a^5D - w^3F^\circ \dagger$
													(15)
*2801.484	A	15d?	1.33	5.74	2-3	$a^5S - v^5F^\circ \dagger$	2869.567	A	6	1.52	5.82	4-3	$a^5D - w^3D^\circ \dagger$
*2801.484	A	15d?	1.33	5.74	2-2	(3)	2835.906	A	10	1.46	5.82	3-2	(16)
2756.266	A	15	1.33	5.81	2-1	$a^5S - 10^\circ$	2829.946	A	18	1.46	5.82	3-3	
						(4)	2797.921	A	10	1.41	5.82	2-3	
2754.286	A	15	1.33	5.81	2-3	$a^5S - 12^\circ$	2808.383	A	10d	1.41	5.81	2-2	$a^5D - 11^\circ \dagger$
						(5)							(17)
2745.078	A	20	1.33	5.82	2-2	$a^5S - y^5G^\circ$	2807.362	A	40	1.41	5.81	2-3	$a^5D - 12^\circ \dagger$
						(6)							(18)
2471.962	A	10R	1.33	6.32	2-3	$a^5S - w^5P^\circ$	2851.171	A	10	1.52	5.85	4-4	$a^5D - y^5G^\circ \dagger$
2567.051	A	5R	1.33	6.14	2-2	(7)	2797.775	A	10	1.41	5.82	2-2	(19)
2582.157	A	4R	1.33	6.11	2-1		2829.788	A	20	1.46	5.82	3-2	
*2474.703	A	10	1.33	6.32	2-1	$a^5S - 40^\circ$	2755.36	A	10	1.35	5.83	0-1	$a^5D - 14^\circ \dagger$
						(8)							(20)
2981.517	A	30	1.46	5.60	3-2	$a^5D - 4^\circ \dagger$	*2757.09	A	10	1.38	5.85	1-1	$a^5D - 17^\circ \dagger$
2946.03	A	20	1.41	5.60	2-2	(9)	2798.029	A	10	1.46	5.88	3-2	$a^5D - 19^\circ \dagger$
2985.15	A	10	1.52	5.66	4-5	$a^5D - x^3G^\circ \dagger$							(22)
3010.258	A	20	1.52	5.62	4-4	(10)	*2757.09	A	10	1.41	5.89	2-1	$a^5D - 21^\circ \dagger$
													(23)
2982.130	A	5	1.52	5.66	4-4	$a^5D - w^5F^\circ \dagger$	2787.832	A	6	1.52	5.95	4-3	$a^5D - v^3D^\circ \dagger$
2959.812	A	7	1.46	5.63	3-3	(11)	2759.575	A	10	1.46	5.94	3-2	(24)
2942.860	A	8	1.41	5.61	2-2		2746.883	A	10	1.41	5.91	2-3	$a^5D - 22^\circ \dagger$
2978.28	A	30	1.46	5.61	3-2								(25)
2916.112	A	10	1.38	5.61	1-2		2761.533	A	5	1.52	5.99	4-5	$a^5D - u^5F^\circ \dagger$
2881.656	A	8	1.38	5.66	1-1	$a^5D - z^3S^\circ \dagger$	2751.470	A	15	1.46	5.95	3-4	(26)
						(12)	2725.150	A	5	1.38	5.90	1-2	
2864.647	A	10	1.46	5.77	3-4	$a^5D - v^5F^\circ \dagger$	2697.805	A	5	1.35	5.93	0-1	
2905.260	A	10	1.52	5.77	4-4	(13)							
2931.092	A	8	1.52	5.74	4-3								
2889.829	A	8	1.46	5.74	3-2								

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Air							Air						
2679.855	A	5R	1.52	6.13	4-5	$a^5D - t^5F^\circ \uparrow$	2977.26	A	8	2.49	6.63	4-3	$b^5D - 81^\circ \uparrow$
2649.466	A	5R	1.46	6.12	3-4	(27)	*2988.225	A	20	2.50	6.63	2-3	(41)
2629.852	A	10R?	1.41	6.11	2-3								
*2616.792	A	5R	1.38	6.09	1-2		2971.547	A	20	2.49	6.64	4-4	$b^5D - 82^\circ$
2615.398	A	5	1.35	6.07	0-1		2988.676	A	25	2.51	6.64	3-4	(42)
2658.114	A	10	1.46	6.11	3-3								
2627.56	A	8R?	1.38	6.07	1-1		2906.051	A	10	2.48	6.73	1-1	$b^5D - 90^\circ$
2666.750	A	8	1.46	6.09	3-2		2892.567	A	8	2.46	6.73	0-1	(43)
2572.336	A	5R	1.52	6.32	4-3	$a^5D - w^5P^\circ$	2915.389	A	10	2.50	6.74	2-1	$b^5D - 91^\circ$
2640.989	A	5R	1.46	6.14	3-2	(28)	2902.621	A	8	2.48	6.74	1-1	(44)
2628.74	A	10R?	1.41	6.11	2-1								
2540.431	A	50	1.46	6.32	3-3		2882.545	A	8	2.49	6.77	4-3	$b^5D - 94^\circ$
2613.087	A	5R	1.41	6.14	2-2		2898.644	A	10	2.51	6.77	3-3	(45)
2607.381	A	5	1.38	6.11	1-1								
2514.603	A	3w	1.41	6.32	2-3								
2591.982	A	4R?	1.38	6.14	1-2								
2595.407	A	8R	1.35	6.11	0-1		2945.680	A	20	2.59	6.78	2-3	$a^3D - 95^\circ \uparrow$
2655.027	A	5R	1.52	6.17	4-3	$a^5D - v^5P^\circ \uparrow$							(46)
						(29)							
2162.34	A	20	1.46	7.17	3-4	$a^5D - 110^\circ$	2936.504	A	8	2.64	6.84	5-5	$a^3G - 100^\circ$
						(30)							(47)
2180.48	A	10	1.52	7.18	4-3	$a^5D - 111^\circ$	2876.530	A	10	2.61	6.90	4-4	$a^3G - 102^\circ \uparrow$
2157.54	A	10	1.46	7.18	3-3	(31)	2859.574	A	8	2.59	6.90	3-4	(48)
							2886.599	A	10	2.64	6.91	5-5	$a^3G - 103^\circ$
2760.003	A	10	2.07	6.54	5-4	$a^5G - 67^\circ \uparrow$	2870.903	A	8	2.61	6.91	4-5	(49)
						(32)	2837.904	A	10	2.61	6.96	4-3	$a^3G - 104^\circ \uparrow$
2746.404	A	10	2.07	6.57	6-6	$a^5G - 69^\circ$							(50)
						(33)							
2745.394	A	10	2.07	6.57	6-5	$a^5G - 70^\circ \uparrow$	2752.145	A	10	2.90	7.39	4-5	$a^3F - 118^\circ$
						(34)							(51)
*2474.703	A	10	2.07	7.05	4-3	$a^5G - 108^\circ \uparrow$							
						(35)							
2420.245	A	10	2.07	7.17	5-4	$a^5G - 110^\circ \uparrow$	2864.299	A	10	2.98	7.28	4-5	$a^3H - 113^\circ \uparrow$
						(36)	2828.794	A	10	2.98	7.34	4-5	$a^3H - 116^\circ \uparrow$
													(53)
2826.752	A	10	2.25	6.62	3-3	$a^5P - 78^\circ$	2873.636	A	8	3.06	7.36	6-6	$a^3H - 117^\circ$
2836.970	A	8	2.27	6.62	2-3	(37)	2844.396	A	20	3.02	7.36	5-6	(54)
							2796.777	A	10	2.98	7.39	4-5	$a^3H - 118^\circ \uparrow$
													(55)
2997.402	A	10	2.48	6.60	1-1	$b^5D - 76^\circ \uparrow$							
2983.035	A	10	2.46	6.60	0-1	(38)							
3001.425	A	10	2.50	6.62	2-2	$b^5D - 77^\circ \uparrow$	2985.835	A	10	3.15	7.28	5-5	$a^3I - 113^\circ$
2987.904	A	20	2.48	6.62	1-2	(39)							(56)
2989.78	A	50	2.49	6.62	4-3	$b^5D - 78^\circ$	2915.253	A	8	3.15	7.39	6-5	$a^3I - 118^\circ$
3007.124	A	5	2.51	6.62	3-3	(40)							(57)
3000.854	A	60	2.50	6.62	2-3		2893.226	A	10	3.16	7.43	7-6	$a^3I - 119^\circ \uparrow$
													(58)

Mo I—Continued

Mo I—Continued

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Strongest Unclassified Lines of Mo I													
Air							Air						
2972.95	A	10					2279.496	A	10				
2970.08	A	20					2262.07	A	20b				
2962.884	A	10					2249.934	A	40				
2937.67	A	10					2246.139	A	12				
2930.39	A	10					2245.95	A	10				
2913.531	A	10					2237.864	A	15				
2902.235	A	8					2232.778	A	22				
2876.91	A	10					2223.924	A	100R				
2871.897	A	8					2220.26	A	100R				
2862.830	A	10					2202.88	A	25				
2803.138	A	10					2196.26	A	15				
2794.744	A	10					2191.109	A	10				
2758.633	A	10					2184.077	A	10				
2750.79	A	10					2104.29	A	22				
2661.220	A	20					2067.81	A	15				
2644.138	A	30					2065.67	A	15				
2639.685	A	40					2063.44	A	10b				
2633.686	A	12					2060.29	A	10				
2437.43	A	10					2049.38	A	20d				
2304.32	A	10					2022.27	A	10				

Mo II

I P 16.09 Anal A List B July 1958

REFERENCE

A C. C. Kiess, J. Research Nat. Bur. Std. **60**, 375, RP2856 (1958). W L, I, T, I P

Mo II

Mo II

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Air							Air						
*2045.98	A	75	0.00	6.03	$2\frac{1}{2}-2\frac{1}{2}$	$a^6S - z^4P^o$	2816.153‡	A	150	1.66	6.04	$4\frac{1}{2}-5\frac{1}{2}$	$a^6D - z^6F^o$
2081.67	A	25	0.00	5.93	$2\frac{1}{2}-1\frac{1}{2}$	(1)	2848.238	A	175	1.59	5.93	$3\frac{1}{2}-4\frac{1}{2}$	(4)
2020.32	A	100r	0.00	6.11	$2\frac{1}{2}-3\frac{1}{2}$	$a^6S - z^6P^o$	2871.506	A	125	1.53	5.83	$2\frac{1}{2}-3\frac{1}{2}$	
2015.12	A	50	0.00	6.12	$2\frac{1}{2}-2\frac{1}{2}$	(2)	2890.995	A	100	1.49	5.75	$1\frac{1}{2}-2\frac{1}{2}$	
2038.46	A	75r	0.00	6.05	$2\frac{1}{2}-1\frac{1}{2}$		2909.108	A	75	1.45	5.70	$0\frac{1}{2}-1\frac{1}{2}$	
Vac							2894.446	A	80	1.66	5.93	$4\frac{1}{2}-4\frac{1}{2}$	
1987.97	A	20	0.00	6.21	$2\frac{1}{2}-3\frac{1}{2}$	$a^6S - z^6D^o$	2911.915	A	125	1.59	5.83	$3\frac{1}{2}-3\frac{1}{2}$	
1977.17	A	20	0.00	6.24	$2\frac{1}{2}-2\frac{1}{2}$	(3)	2923.387	A	100	1.53	5.75	$2\frac{1}{2}-2\frac{1}{2}$	
1992.35	A	10	0.00	6.20	$2\frac{1}{2}-1\frac{1}{2}$		2930.478	A	100	1.49	5.70	$1\frac{1}{2}-1\frac{1}{2}$	
							2934.293	A	100	1.45	5.66	$0\frac{1}{2}-0\frac{1}{2}$	
							2960.228	A	50	1.66	5.83	$4\frac{1}{2}-3\frac{1}{2}$	
							2965.276	A	60	1.59	5.75	$3\frac{1}{2}-2\frac{1}{2}$	
							2963.786	A	75	1.53	5.70	$2\frac{1}{2}-1\frac{1}{2}$	
							2956.057	A	30	1.49	5.66	$1\frac{1}{2}-0\frac{1}{2}$	

Mo II—Continued

I A	Ref	Int	E P		J	Multiplet No.
			Low	High		
Air						
2780.022	A	50	1.59	6.03	$3\frac{1}{2}-2\frac{1}{2}$	$a^6D - z^4P^\circ \uparrow$ (5)
*2807.750	A	100	1.53	5.93	$2\frac{1}{2}-1\frac{1}{2}$	
2842.148	A	40	1.49	5.83	$1\frac{1}{2}-0\frac{1}{2}$	
2743.185	A	25	1.53	6.03	$2\frac{1}{2}-2\frac{1}{2}$	
2777.86	A	15	1.49	5.93	$1\frac{1}{2}-1\frac{1}{2}$	
2822.035	A	12	1.45	5.83	$0\frac{1}{2}-0\frac{1}{2}$	
2775.386	A	50	1.66	6.11	$4\frac{1}{2}-3\frac{1}{2}$	$a^6D - z^6P^\circ \uparrow$ (6)
2729.680	A	20	1.53	6.05	$2\frac{1}{2}-1\frac{1}{2}$	
2732.889	A	15	1.59	6.11	$3\frac{1}{2}-3\frac{1}{2}$	
2687.994	A	60	1.53	6.12	$2\frac{1}{2}-2\frac{1}{2}$	
2701.409	A	50	1.49	6.05	$1\frac{1}{2}-1\frac{1}{2}$	
2660.581	A	100	1.49	6.12	$1\frac{1}{2}-2\frac{1}{2}$	
*2683.234	A	50	1.45	6.05	$0\frac{1}{2}-1\frac{1}{2}$	
2684.148	A	60	1.66	6.26	$4\frac{1}{2}-4\frac{1}{2}$	$a^6D - z^6D^\circ$ (7)
2672.84	A	60	1.59	6.21	$3\frac{1}{2}-3\frac{1}{2}$	
2619.759	A	15	1.53	6.24	$2\frac{1}{2}-2\frac{1}{2}$	
2619.340	A	30	1.45	6.17	$0\frac{1}{2}-0\frac{1}{2}$	
2713.501	A	30	1.66	6.21	$4\frac{1}{2}-3\frac{1}{2}$	
2653.348	A	60	1.59	6.24	$3\frac{1}{2}-2\frac{1}{2}$	
2646.487	A	60	1.53	6.20	$2\frac{1}{2}-1\frac{1}{2}$	
2636.672	A	50	1.49	6.17	$1\frac{1}{2}-0\frac{1}{2}$	
2644.343	A	50	1.59	6.26	$3\frac{1}{2}-4\frac{1}{2}$	
2638.768	A	100	1.53	6.21	$2\frac{1}{2}-3\frac{1}{2}$	
*2593.707	A	50	1.49	6.24	$1\frac{1}{2}-2\frac{1}{2}$	
2602.802	A	80	1.45	6.20	$0\frac{1}{2}-1\frac{1}{2}$	
2538.444	A	200	1.66	6.52	$4\frac{1}{2}-4\frac{1}{2}$	$a^6D - z^4F^\circ \uparrow$ (8)
2542.668	A	50	1.59	6.45	$3\frac{1}{2}-3\frac{1}{2}$	
2542.783	A	30	1.53	6.39	$2\frac{1}{2}-2\frac{1}{2}$	
2541.251	A	10	1.49	6.34	$1\frac{1}{2}-1\frac{1}{2}$	
2579.437	A	20	1.66	6.45	$4\frac{1}{2}-3\frac{1}{2}$	
2574.425	A	30	1.59	6.39	$3\frac{1}{2}-2\frac{1}{2}$	
*2566.257	A	30	1.53	6.34	$2\frac{1}{2}-1\frac{1}{2}$	
2835.342	A	30	1.91	6.26	$5\frac{1}{2}-4\frac{1}{2}$	$a^4G - z^6D^\circ \uparrow$ (9)
2836.307	A	10	1.89	6.24	$3\frac{1}{2}-2\frac{1}{2}$	
2856.900	A	10	1.88	6.20	$2\frac{1}{2}-1\frac{1}{2}$	
*2673.27	A	40	1.91	6.52	$5\frac{1}{2}-4\frac{1}{2}$	$a^4G - z^4F^\circ \uparrow$ (10)
2717.357	A	100	1.90	6.45	$4\frac{1}{2}-3\frac{1}{2}$	
2746.305	A	35	1.89	6.39	$3\frac{1}{2}-2\frac{1}{2}$	
2763.626	A	20	1.88	6.34	$2\frac{1}{2}-1\frac{1}{2}$	
*2671.86	A	40	1.90	6.52	$4\frac{1}{2}-4\frac{1}{2}$	
2710.207	A	15	1.89	6.45	$3\frac{1}{2}-3\frac{1}{2}$	
*2269.708§	A	150	1.91	7.34	$5\frac{1}{2}-6\frac{1}{2}$	$a^4G - z^4H^\circ$ (11)
2306.990	A	50	1.90	7.25	$4\frac{1}{2}-5\frac{1}{2}$	
2332.131	A	40	1.89	7.18	$3\frac{1}{2}-4\frac{1}{2}$	
2341.57	A	40	1.88	7.15	$2\frac{1}{2}-3\frac{1}{2}$	
2307.994	A	30	1.91	7.25	$5\frac{1}{2}-5\frac{1}{2}$	
2337.432	A	15	1.90	7.18	$4\frac{1}{2}-4\frac{1}{2}$	
2348.832	A	20	1.89	7.15	$3\frac{1}{2}-3\frac{1}{2}$	
2338.482	A	10	1.91	7.18	$5\frac{1}{2}-4\frac{1}{2}$	
*2354.186	A	20	1.90	7.15	$4\frac{1}{2}-3\frac{1}{2}$	
2188.96	A	25	1.91	7.54	$5\frac{1}{2}-5\frac{1}{2}$	$a^4G - z^4G^\circ \uparrow$ (12)
2231.49	A	18	1.90	7.44	$4\frac{1}{2}-4\frac{1}{2}$	
2232.44	A	30	1.91	7.44	$5\frac{1}{2}-4\frac{1}{2}$	
2188.04	A	40	1.90	7.54	$4\frac{1}{2}-5\frac{1}{2}$	
2163.78	A	25	1.91	7.61	$5\frac{1}{2}-6\frac{1}{2}$	$a^4G - z^4I^\circ$ (13)
2197.27	A	25	1.90	7.52	$4\frac{1}{2}-5\frac{1}{2}$	
2254.146	A	15	1.89	7.37	$3\frac{1}{2}-4\frac{1}{2}$	
2260.07	A	20	1.91	7.37	$5\frac{1}{2}-4\frac{1}{2}$	
2236.04	A	50	1.90	7.42	$4\frac{1}{2}-3\frac{1}{2}$	$a^4G - z^2G^\circ \uparrow$ (14)
*2194.94	A	12	1.90	7.53	$4\frac{1}{2}-4\frac{1}{2}$	
2224.64	A	35	1.88	7.42	$2\frac{1}{2}-3\frac{1}{2}$	

Mo II—Continued

I A	Ref	Int	E P		J	Multiplet No.
			Low	High		
Air						
2124.09	A	25	1.90	7.71	4½-3½	a 4G - x 4D° (15)
2126.46	A	15	1.89	7.70	3½-2½	
2111.18	A	20d?	1.88	7.72	2½-1½	
2119.71	A	25	1.89	7.71	3½-3½	
2120.53	A	15	1.88	7.70	2½-2½	
2115.10	A	25	1.89	7.73	3½-2½	a 4G - 1° (16)
2109.23	A	18	1.88	7.73	2½-2½	
2068.20	A	12	1.91	7.87	5½-4½	a 4G - y 4F° (17)
2079.98	A	10	1.89	7.83	3½-2½	
2091.23	A	25	1.88	7.78	2½-1½	
2067.36	A	20	1.90	7.87	4½-4½	
2092.53	A	30	1.89	7.79	3½-3½	
2074.31	A	30	1.88	7.83	2½-2½	
2063.20	A	10	1.89	7.87	3½-4½	
2086.77	A	20	1.88	7.79	2½-3½	
*2100.83	A	50	1.90	7.78	4½-3½	a 4G - 2° (18)
2096.55	A	12	1.89	7.78	3½-3½	
2093.11	A	50	1.91	7.80	5½-5½	a 4G - y 4G°† (19)
2103.43	A	18	1.90	7.77	4½-4½	
2100.70	A	30	1.89	7.77	3½-3½	
2089.53	A	40	1.88	7.78	2½-2½	
2105.03	A	40	1.90	7.77	4½-3½	
2095.29	A	35	1.89	7.78	3½-2½	
2099.14	A	12	1.89	7.77	3½-4½	
2052.21	A	10	1.90	7.92	4½-5½	a 4G - y 4H°† (20)
2075.43	A	10	1.89	7.84	3½-4½	
2084.07	A	18	1.89	7.81	3½-3½	
2080.47	A	40	1.91	7.84	5½-4½	
2088.30	A	30	1.90	7.81	4½-3½	
2059.23	A	20	1.89	7.89	3½-3½	a 4G - z 2F°† (21)
2032.04	A	20	1.88	7.95	2½-2½	
2046.94	A	18	1.89	7.92	3½-2½	a 4G - x 4F°† (22)
2044.38	A	40	1.90	7.94	4½-4½	
2045.48	A	20	1.89	7.93	3½-3½	
2041.45	A	20	1.88	7.92	2½-2½	
2002.12	A	18	1.89	8.06	3½-3½	a 4G - y 2F°† (23)
2000.24	A	20	1.91	8.08	5½-5½	a 4G - y 2H°† (24)
Vac						
1949.44	A	35	1.91	8.24	5½-5½	a 4G - x 4G°† (25)
1962.18	A	15	1.90	8.20	4½-4½	
1978.91	A	15	1.88	8.11	2½-2½	
1984.06	A	10	1.89	8.11	3½-2½	
1948.71	A	12	1.90	8.24	4½-5½	
1958.45	A	10	1.89	8.20	3½-4½	a 4P - z 6D°† (26)
Air						
2865.64	A	10	1.94	6.24	2½-2½	
*2935.196	A	15	1.96	6.17	0½-0½	
2897.627	A	35	1.94	6.20	2½-1½	
2918.835	A	40	1.94	6.17	1½-0½	a 4P - z 4D°† (27)
*2498.280	A	40	1.94	6.88	2½-3½	
2529.807	A	40	1.94	6.82	1½-2½	

I A	Ref	Int	E P		J	Multiplet No.		I A	Ref	Int	E P		J	Multiplet No.
			Low	High							Low	High		
Air							Air							
2516.092	A	50	2.87	7.77	6½-6½	a 2I -z 2I°	2468.790	A	70	2.94	7.94	4½-4½	a 4F -x 4F°	
2515.101	A	50	2.84	7.74	5½-5½	(58)	*2477.570	A	100	2.94	7.93	3½-3½	(75)	
2499.253	A	20	2.84	7.77	5½-6½		2484.752	A	40	2.95	7.92	2½-2½		
							2513.950	A	20	2.98	7.89	1½-1½		
2387.819	A	15	2.87	8.04	6½-6½	a 2I -y 4H°	2479.75	A	10	2.94	7.92	3½-2½		
2444.735	A	30	2.87	7.92	6½-5½	(59)	2470.043	A	50	2.94	7.94	3½-4½		
2467.350	A	50	2.84	7.84	5½-4½		2482.566	A	60	2.95	7.93	2½-3½		
*2372.642	A	10	2.84	8.04	5½-6½		2497.371	A	35	2.98	7.92	1½-2½		
2390.102	A	20	2.87	8.03	6½-5½	a 2I -z 2H°	2423.988	A	70	2.94	8.03	4½-5½	a 4F -z 2H°	
2429.390	A	50	2.84	7.92	5½-4½	(60)	2482.075	A	20	2.94	7.92	3½-4½	(76)	
2374.900	A	20	2.84	8.03	5½-5½									
							2438.356	A	15	2.94	8.01	3½-3½	a 4F -y 2G°†	
2340.41	A	35	2.84	8.11	5½-4½	a 2I -y 2G°	2389.250	A	40	2.94	8.11	3½-4½	(77)	
						(61)	2443.188	A	45	2.95	8.01	2½-3½		
2370.250	A	40	2.87	8.08	6½-5½	a 2I -y 2H°†	*2419.011	A	45	2.95	8.06	2½-3½	a 4F -y 2F°†	
2355.309	A	15	2.84	8.08	5½-5½	(62)	2430.272	A	25	2.98	8.06	1½-2½	(78)	
2182.76	A	10	2.87	8.52	6½-7½	a 2I -z 2K°	*2403.60§	A	50	2.94	8.08	4½-5½	a 4F -y 2H°	
2226.06	A	20	2.84	8.38	5½-6½	(63)	*2413.017	A	50	2.94	8.06	3½-4½	(79)	
2239.42	A	50	2.87	8.38	6½-6½		2411.836	A	40	2.94	8.06	4½-4½		
2189.40	A	50	2.87	8.51	6½-6½	a 2I -y 2I°†	2408.337	A	20	2.95	8.08	2½-1½	a 4F -y 2D°†	
2197.48	A	100	2.84	8.45	5½-5½	(64)	2420.180	A	45	2.98	8.08	1½-1½	(80)	
							2383.371	A	20	2.98	8.16	1½-2½		
2108.04	A	50	2.87	8.72	6½-5½	a 2I -x 2H°								
2125.92	A	75	2.84	8.64	5½-4½	(65)	2329.708	A	50	2.94	8.24	4½-5½	a 4F -x 4G°†	
2069.80	A	20	2.87	8.83	6½-5½	a 2I -w 2H°	2350.120	A	25	2.94	8.20	3½-4½	(81)	
2042.66	A	40	2.84	8.88	5½-4½	(66)	2371.58	A	20	2.95	8.16	2½-3½		
							2403.428	A	40	2.98	8.11	1½-2½		
							2349.005	A	10	2.94	8.20	4½-4½		
							2367.028	A	10	2.94	8.16	3½-3½		
							2391.743	A	45	2.95	8.11	2½-2½		
2581.373	A	40	2.94	7.54	4½-5½	a 4F -z 4G°†								
2863.20	A	18	2.98	7.29	1½-2½	(67)	2381.480	A	40	2.94	8.13	3½-3½	a 4F -3°	
2846.632	A	15	2.95	7.29	2½-2½		2386.07	A	45	2.95	8.13	2½-3½	(82)	
2695.217	A	35	2.94	7.52	4½-5½	a 4F -z 4I°†	2246.980	A	40	2.94	8.43	4½-4½	a 4F -w 4F°†	
2790.427	A	30	2.94	7.37	3½-4½	(68)	2255.290	A	7	2.94	8.42	3½-3½	(83)	
2591.776	A	30	2.94	7.71	3½-2½	a 4F -y 4P°†	2165.19	A	75	2.94	8.64	4½-4½	a 4F -x 2H°	
						(69)							(84)	
2585.966	A	20	2.94	7.71	4½-3½	a 4F -x 4D°†								
2597.392	A	40	2.94	7.70	3½-2½	(70)								
2588.788	A	30	2.95	7.72	2½-1½		2564.334	A	40	3.13	7.94	3½-4½	b 4D -x 4F°	
*2576.565	A	30	2.98	7.77	1½-0½		2557.378	A	30	3.10	7.93	2½-3½	(85)	
2592.782	A	25	2.95	7.71	2½-3½		2530.327	A	50	3.04	7.92	1½-2½		
							2528.852	A	50	3.01	7.89	0½-1½		
2533.580	A	40	2.95	7.83	2½-2½	a 4F -y 4F°†	2572.475	A	10	3.13	7.93	3½-3½		
2572.241	A	30	2.98	7.78	1½-1½	(71)	2559.688	A	30	3.10	7.92	2½-2½		
2545.600	A	20	2.94	7.79	4½-3½		2547.34	A	50	3.04	7.89	1½-1½		
2528.383	A	30	2.94	7.83	3½-2½									
2558.867	A	40	2.95	7.78	2½-1½		2490.018	A	50	3.10	8.06	2½-3½	b 4D -y 2F°†	
2552.193	A	20	2.95	7.79	2½-3½							(86)		
2556.756	A	40	2.94	7.77	3½-4½	a 4F -y 4G°†	*2453.798	A	25	3.13	8.16	3½-2½	b 4D -y 2D°	
2555.420	A	50	2.94	7.77	4½-4½	(72)	2478.672	A	30	3.10	8.08	2½-1½	(87)	
2559.121	A	30	2.94	7.77	3½-3½		2440.05	A	40	3.10	8.16	2½-2½		
2556.309	A	15	2.95	7.78	2½-2½		2433.970	A	15	3.01	8.08	0½-1½		
2480.193	A	10	2.94	7.92	4½-5½	a 4F -y 4H°†	2416.182	A	20	3.13	8.24	3½-3½	b 4D -w 4D°	
2521.683	A	30	2.94	7.84	3½-4½	(73)	*2419.011	A	45	3.13	8.23	3½-2½	(88)	
2520.392	A	20	2.94	7.84	4½-4½									
2534.41	A	10	2.94	7.81	3½-3½									
2496.520	A	30	2.94	7.89	4½-3½	a 4F -z 2F°†	2798.910	A	10	3.03	7.44	3½-4½	a 2F -z 4G°†	
2465.879	A	30	2.94	7.95	3½-2½	(74)	2835.789	A	25	3.07	7.34	2½-3½	(89)	
2497.80	A	50	2.94	7.89	3½-3½		2842.492	A	35	3.03	7.37	3½-4½	a 2F -z 4I°	
												(90)		

Mo II—Continued

Mo II—Continued

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Air							Air						
*2539.436	A	40	3.03	7.89	$3\frac{1}{2}-3\frac{1}{2}$	$a^2F - z^2F^{\circ}\dagger$	2955.828	A	50	3.26	7.44	$3\frac{1}{2}-4\frac{1}{2}$	$a^2G - z^4G^{\circ}\dagger$
2527.135	A	50	3.07	7.95	$2\frac{1}{2}-2\frac{1}{2}$	(91)	3022.748	A	10	3.26	7.34	$3\frac{1}{2}-3\frac{1}{2}$	(110)
2560.669	A	20	3.07	7.89	$2\frac{1}{2}-3\frac{1}{2}$		2992.250	A	20	3.22	7.34	$4\frac{1}{2}-3\frac{1}{2}$	
*2539.436	A	40	3.07	7.93	$2\frac{1}{2}-3\frac{1}{2}$	$a^2F - x^4F^{\circ}\dagger$	2868.116	A	25	3.22	7.52	$4\frac{1}{2}-5\frac{1}{2}$	$a^2G - z^4I^{\circ}\dagger$
2518.53	A	20	3.03	7.93	$3\frac{1}{2}-3\frac{1}{2}$	(92)	3004.45	A	60	3.26	7.37	$3\frac{1}{2}-4\frac{1}{2}$	(111)
2427.289	A	25	3.03	8.11	$3\frac{1}{2}-4\frac{1}{2}$	$a^2F - y^2G^{\circ}$	2726.983	A	100	3.22	7.74	$4\frac{1}{2}-5\frac{1}{2}$	$a^2G - z^2I^{\circ}$
*2498.280	A	40	3.07	8.01	$2\frac{1}{2}-3\frac{1}{2}$	(93)							(112)
2478.008	A	30	3.03	8.01	$3\frac{1}{2}-3\frac{1}{2}$		2522.84	A	40	3.22	8.11	$4\frac{1}{2}-4\frac{1}{2}$	$a^2G - y^2G^{\circ}\dagger$
2453.143	A	45	3.03	8.06	$3\frac{1}{2}-3\frac{1}{2}$	$a^2F - y^2F^{\circ}\dagger$	2600.233	A	20	3.26	8.01	$3\frac{1}{2}-3\frac{1}{2}$	(113)
						(94)	2550.740	A	40	3.22	8.06	$4\frac{1}{2}-3\frac{1}{2}$	$a^2G - y^2F^{\circ}$
2404.680	A	50	3.03	8.16	$3\frac{1}{2}-2\frac{1}{2}$	$a^2F - y^2D^{\circ}$	2572.873	A	10	3.26	8.06	$3\frac{1}{2}-3\frac{1}{2}$	(114)
2461.805	A	50	3.07	8.08	$2\frac{1}{2}-1\frac{1}{2}$	(95)							
2423.720	A	15	3.07	8.16	$2\frac{1}{2}-2\frac{1}{2}$		2540.133	A	40	3.22	8.08	$4\frac{1}{2}-5\frac{1}{2}$	$a^2G - y^2H^{\circ}$
*2386.965	A	25	3.03	8.20	$3\frac{1}{2}-4\frac{1}{2}$	$a^2F - x^4G^{\circ}\dagger$	2571.447	A	20	3.26	8.06	$3\frac{1}{2}-4\frac{1}{2}$	(115)
2444.482	A	45	3.07	8.11	$2\frac{1}{2}-2\frac{1}{2}$	(96)	2549.351	A	10	3.22	8.06	$4\frac{1}{2}-4\frac{1}{2}$	
2438.574	A	40	3.07	8.13	$2\frac{1}{2}-3\frac{1}{2}$	$a^2F - 3^{\circ}\dagger$	2457.771	A	100	3.22	8.24	$4\frac{1}{2}-5\frac{1}{2}$	$a^2G - x^4G^{\circ}\dagger$
						(97)	2479.239	A	50	3.22	8.20	$4\frac{1}{2}-4\frac{1}{2}$	(116)
							2498.088	A	40	3.22	8.16	$4\frac{1}{2}-3\frac{1}{2}$	
							2542.041	A	20	3.26	8.11	$3\frac{1}{2}-2\frac{1}{2}$	
2940.090	A	50	3.35	7.54	$6\frac{1}{2}-5\frac{1}{2}$	$a^4H - z^4G^{\circ}\dagger$	2381.14	A	40	3.22	8.40	$4\frac{1}{2}-4\frac{1}{2}$	$a^2G - x^2G^{\circ}\dagger$
2985.309	A	8	3.30	7.44	$5\frac{1}{2}-4\frac{1}{2}$	(98)	2417.367	A	20	3.26	8.37	$3\frac{1}{2}-3\frac{1}{2}$	(117)
3030.315	A	18	3.27	7.34	$4\frac{1}{2}-3\frac{1}{2}$								
2989.855	A	50	3.21	7.34	$3\frac{1}{2}-3\frac{1}{2}$								
2886.982	A	15	3.27	7.54	$4\frac{1}{2}-5\frac{1}{2}$								
2853.220	A	150	3.35	7.67	$6\frac{1}{2}-7\frac{1}{2}$	$a^4H - z^4I^{\circ}\dagger$	*2992.840	A	75	3.58	7.71	$2\frac{1}{2}-2\frac{1}{2}$	$b^4P - y^4P^{\circ}\dagger$
2863.801	A	90	3.30	7.61	$5\frac{1}{2}-6\frac{1}{2}$	(99)	*2955.154	A	20	3.41	7.59	$1\frac{1}{2}-1\frac{1}{2}$	(118)
2903.055	A	125	3.27	7.52	$4\frac{1}{2}-5\frac{1}{2}$		2895.137	A	10	3.28	7.55	$0\frac{1}{2}-0\frac{1}{2}$	
2971.904	A	125	3.21	7.37	$3\frac{1}{2}-4\frac{1}{2}$		*3082.224	A	60	3.58	7.59	$2\frac{1}{2}-1\frac{1}{2}$	
2924.320	A	65	3.30	7.52	$5\frac{1}{2}-5\frac{1}{2}$		2983.590	A	35	3.41	7.55	$1\frac{1}{2}-0\frac{1}{2}$	
3011.948	A	35	3.27	7.37	$4\frac{1}{2}-4\frac{1}{2}$		2868.334	A	25	3.28	7.59	$0\frac{1}{2}-1\frac{1}{2}$	
3034.922	A	40	3.30	7.37	$5\frac{1}{2}-4\frac{1}{2}$								
2730.212	A	25	3.27	7.79	$4\frac{1}{2}-3\frac{1}{2}$	$a^4H - y^4F^{\circ}\dagger$	2986.897	A	50	3.58	7.71	$2\frac{1}{2}-3\frac{1}{2}$	$b^4P - x^4D^{\circ}\dagger$
2676.489	A	20	3.21	7.83	$3\frac{1}{2}-2\frac{1}{2}$	(100)	*2879.75	A	10	3.41	7.70	$1\frac{1}{2}-2\frac{1}{2}$	(119)
							*3000.290	A	60	3.58	7.70	$2\frac{1}{2}-2\frac{1}{2}$	
2769.762	A	25	3.35	7.80	$6\frac{1}{2}-5\frac{1}{2}$	$a^4H - y^4G^{\circ}\dagger$	2977.760	A	50	3.58	7.73	$2\frac{1}{2}-2\frac{1}{2}$	$b^4P - 1^{\circ}$
2760.537	A	18	3.30	7.77	$5\frac{1}{2}-4\frac{1}{2}$	(101)	2859.002	A	15	3.41	7.73	$1\frac{1}{2}-2\frac{1}{2}$	(120)
2744.193	A	25	3.27	7.77	$4\frac{1}{2}-3\frac{1}{2}$		2323.96	A	50	3.58	8.89	$2\frac{1}{2}-1\frac{1}{2}$	$b^4P - w^2D^{\circ}$
2701.875	A	20	3.21	7.78	$3\frac{1}{2}-2\frac{1}{2}$		*2200.25	A	22	3.28	8.89	$0\frac{1}{2}-1\frac{1}{2}$	(121)
2741.314	A	15	3.30	7.80	$5\frac{1}{2}-5\frac{1}{2}$								
2710.928	A	15	3.21	7.77	$3\frac{1}{2}-3\frac{1}{2}$								
2630.741	A	80	3.35	8.04	$6\frac{1}{2}-6\frac{1}{2}$	$a^4H - y^4H^{\circ}\dagger$	*2976.898	A	30	3.38	7.53	$3\frac{1}{2}-2\frac{1}{2}$	$b^2F - z^2D^{\circ}$
*2683.234	A	50	3.21	7.81	$3\frac{1}{2}-3\frac{1}{2}$	(102)	3127.817	A	25	3.44	7.39	$2\frac{1}{2}-1\frac{1}{2}$	(122)
2605.079	A	50	3.30	8.04	$5\frac{1}{2}-6\frac{1}{2}$		2978.607	A	50	3.38	7.53	$3\frac{1}{2}-4\frac{1}{2}$	$b^2F - z^2G^{\circ}$
							3099.249	A	35	3.44	7.42	$2\frac{1}{2}-3\frac{1}{2}$	(123)
2633.52	A	100	3.35	8.03	$6\frac{1}{2}-5\frac{1}{2}$	$a^4H - z^2H^{\circ}\dagger$	2500.425	A	40	3.38	8.32	$3\frac{1}{2}-3\frac{1}{2}$	$b^2F - x^2F^{\circ}$
2624.643	A	30	3.21	7.92	$3\frac{1}{2}-4\frac{1}{2}$	(103)	2513.12	A	30	3.38	8.35	$3\frac{1}{2}-2\frac{1}{2}$	(124)
*2566.257	A	30	3.30	8.11	$5\frac{1}{2}-4\frac{1}{2}$	$a^4H - y^2G^{\circ}$	2459.762	A	70	3.38	8.40	$3\frac{1}{2}-4\frac{1}{2}$	$b^2F - x^2G^{\circ}$
2605.826	A	10	3.27	8.01	$4\frac{1}{2}-3\frac{1}{2}$	(104)	2506.684	A	40	3.44	8.37	$2\frac{1}{2}-3\frac{1}{2}$	(125)
2575.807	A	10	3.21	8.01	$3\frac{1}{2}-3\frac{1}{2}$		*2477.570	A	100	3.38	8.37	$3\frac{1}{2}-3\frac{1}{2}$	
2521.059	A	30	3.21	8.11	$3\frac{1}{2}-4\frac{1}{2}$								
2578.347	A	40	3.27	8.06	$4\frac{1}{2}-3\frac{1}{2}$	$a^4H - y^2F^{\circ}\dagger$	2388.703	A	35	3.44	8.61	$2\frac{1}{2}-2\frac{1}{2}$	$b^2F - w^2F^{\circ}\dagger$
*2548.212	A	10	3.21	8.06	$3\frac{1}{2}-2\frac{1}{2}$	(105)							(126)
*2593.707	A	50	3.30	8.06	$5\frac{1}{2}-4\frac{1}{2}$	$a^4H - y^2H^{\circ}\dagger$							
2567.507	A	15	3.27	8.08	$4\frac{1}{2}-5\frac{1}{2}$	(106)							
2547.562	A	30	3.21	8.06	$3\frac{1}{2}-4\frac{1}{2}$		2827.752	A	100	3.41	7.77	$5\frac{1}{2}-6\frac{1}{2}$	$a^2H - z^2I^{\circ}$
							2856.009	A	20	3.42	7.74	$4\frac{1}{2}-5\frac{1}{2}$	(127)
2522.590	A	30	3.35	8.24	$6\frac{1}{2}-5\frac{1}{2}$	$a^4H - x^4G^{\circ}\dagger$	2626.099	A	40	3.41	8.11	$5\frac{1}{2}-4\frac{1}{2}$	$a^2H - y^2G^{\circ}$
2518.700	A	20	3.21	8.11	$3\frac{1}{2}-2\frac{1}{2}$	(107)	2692.63	A	20	3.42	8.01	$4\frac{1}{2}-3\frac{1}{2}$	(128)
2483.383	A	20	3.27	8.24	$4\frac{1}{2}-5\frac{1}{2}$		2632.855	A	10	3.42	8.11	$4\frac{1}{2}-4\frac{1}{2}$	
*2422.1855	A	35	3.27	8.37	$4\frac{1}{2}-3\frac{1}{2}$	$a^4H - x^2G^{\circ}\dagger$	2578.910	A	50	3.41	8.20	$5\frac{1}{2}-4\frac{1}{2}$	$a^2H - x^4G^{\circ}\dagger$
2396.260	A	25	3.21	8.37	$3\frac{1}{2}-3\frac{1}{2}$	(108)	2562.078	A	40	3.42	8.24	$4\frac{1}{2}-5\frac{1}{2}$	(129)
2231.08	A	40	3.30	8.83	$5\frac{1}{2}-5\frac{1}{2}$	$a^4H - w^2H^{\circ}\dagger$	2623.408	A	45	3.42	8.13	$4\frac{1}{2}-3\frac{1}{2}$	$a^2H - 3^{\circ}$
						(109)							(130)

Mo II—Continued

Mo II—Continued

I A	Ref	Int	E P		<i>J</i>	Multiplet No.	I A	Ref	Int	E P		<i>J</i>	Multiplet No.
			Low	High						Low	High		
Air 2497.020	A	35	3.42	8.37	$4\frac{1}{2}-3\frac{1}{2}$	$a^2H-x^2G^\circ\uparrow$ (131)	Air 2945.946	A	100	3.75	7.94	$5\frac{1}{2}-4\frac{1}{2}$	$b^4G-x^4F^\circ\uparrow$ (146)
*2304.261§	A	80	3.41	8.77	$5\frac{1}{2}-4\frac{1}{2}$	$a^2H-w^2G^\circ$ (132)	2941.214	A	80	3.73	7.93	$4\frac{1}{2}-3\frac{1}{2}$	
2309.485	A	20	3.42	8.77	$4\frac{1}{2}-4\frac{1}{2}$		2927.542	A	50	3.71	7.92	$3\frac{1}{2}-2\frac{1}{2}$	
							2922.732	A	22	3.67	7.89	$2\frac{1}{2}-1\frac{1}{2}$	
2276.198	A	40	3.41	8.83	$5\frac{1}{2}-5\frac{1}{2}$	$a^2H-w^2H^\circ$ (133)	2897.42	A	15s	3.67	7.93	$2\frac{1}{2}-3\frac{1}{2}$	
2261.981	A	30	3.42	8.88	$4\frac{1}{2}-4\frac{1}{2}$		2836.721	A	30	3.71	8.06	$3\frac{1}{2}-3\frac{1}{2}$	$b^4G-y^2F^\circ\uparrow$ (147)
2256.982	A	15	3.41	8.88	$5\frac{1}{2}-4\frac{1}{2}$								
2987.960	A	50	3.58	7.71	$4\frac{1}{2}-3\frac{1}{2}$	$b^4F-x^4D^\circ\uparrow$ (134)	2750.027	A	40	3.75	8.24	$5\frac{1}{2}-5\frac{1}{2}$	$b^4G-x^4G^\circ\uparrow$ (148)
2997.326	A	50	3.58	7.70	$3\frac{1}{2}-2\frac{1}{2}$		2763.305	A	7	3.73	8.20	$4\frac{1}{2}-4\frac{1}{2}$	
2968.775	A	40	3.56	7.72	$2\frac{1}{2}-1\frac{1}{2}$		2771.710	A	12	3.71	8.16	$3\frac{1}{2}-3\frac{1}{2}$	
2935.698	A	18	3.57	7.77	$1\frac{1}{2}-0\frac{1}{2}$		2774.401	A	20	3.67	8.11	$2\frac{1}{2}-2\frac{1}{2}$	
*2983.955	A	75d	3.58	7.71	$3\frac{1}{2}-3\frac{1}{2}$		2791.553	A	50	3.71	8.13	$3\frac{1}{2}-3\frac{1}{2}$	$b^4G-3^\circ\uparrow$ (149)
2966.985	A	30	3.58	7.74	$4\frac{1}{2}-5\frac{1}{2}$	$b^4F-z^2I^\circ$ (135)							
2938.292	A	40	3.58	7.78	$3\frac{1}{2}-3\frac{1}{2}$	$b^4F-2^\circ\uparrow$ (136)	*2576.565	A	30	4.25	9.04	$1\frac{1}{2}-1\frac{1}{2}$	$a^2P-x^2P^\circ$ (150)
							2509.148	A	40	3.97	8.88	$0\frac{1}{2}-0\frac{1}{2}$	
2925.416	A	50	3.58	7.80	$4\frac{1}{2}-5\frac{1}{2}$	$b^4F-y^4G^\circ$ (137)							
2943.364	A	40	3.58	7.77	$3\frac{1}{2}-4\frac{1}{2}$		2609.215	A	50	4.06	8.79	$2\frac{1}{2}-3\frac{1}{2}$	$b^2D-w^2G^\circ$ (151)
2936.773	A	40	3.56	7.77	$2\frac{1}{2}-3\frac{1}{2}$								
2926.743	A	20	3.57	7.78	$1\frac{1}{2}-2\frac{1}{2}$								
2947.290	A	125	3.58	7.77	$4\frac{1}{2}-4\frac{1}{2}$		2831.442	A	40	4.15	8.51	$5\frac{1}{2}-6\frac{1}{2}$	$b^2H-y^2I^\circ$ (152)
*2955.154	A	20	3.58	7.77	$3\frac{1}{2}-3\frac{1}{2}$		2821.843	A	18	4.08	8.45	$4\frac{1}{2}-5\frac{1}{2}$	
2926.15	A	20	3.56	7.78	$2\frac{1}{2}-2\frac{1}{2}$		2866.82	A	12	4.15	8.45	$5\frac{1}{2}-5\frac{1}{2}$	
2900.780	A	40	3.58	7.84	$4\frac{1}{2}-4\frac{1}{2}$	$b^4F-y^4H^\circ\uparrow$ (138)	2696.839	A	30	4.15	8.72	$5\frac{1}{2}-5\frac{1}{2}$	$b^2H-x^2H^\circ$ (153)
2913.82	A	30	3.58	7.81	$3\frac{1}{2}-3\frac{1}{2}$		2704.928	A	10	4.08	8.64	$4\frac{1}{2}-4\frac{1}{2}$	
2544.456	A	40	3.58	8.43	$4\frac{1}{2}-4\frac{1}{2}$	$b^4F-w^4F^\circ\uparrow$ (139)	2657.005	A	20	4.08	8.72	$4\frac{1}{2}-5\frac{1}{2}$	
*2543.611	A	40	3.56	8.42	$2\frac{1}{2}-3\frac{1}{2}$								
2055.68	A	40	3.58	9.59	$4\frac{1}{2}-5\frac{1}{2}$	$b^4F-w^4G^\circ\uparrow$ (140)							
2100.36	A	10	3.58	9.45	$3\frac{1}{2}-4\frac{1}{2}$		2872.880	A	60	4.11	8.40	$4\frac{1}{2}-4\frac{1}{2}$	$b^2G-x^2G^\circ$ (154)
2102.36	A	12	3.58	9.45	$4\frac{1}{2}-4\frac{1}{2}$		2888.171	A	50	4.09	8.37	$3\frac{1}{2}-3\frac{1}{2}$	
2134.01	A	10	3.58	9.36	$3\frac{1}{2}-3\frac{1}{2}$		*2671.86	A	40	4.11	8.72	$4\frac{1}{2}-5\frac{1}{2}$	$b^2G-x^2H^\circ\uparrow$ (155)
2174.08	A	15	3.56	9.24	$2\frac{1}{2}-2\frac{1}{2}$		2712.346	A	20	4.09	8.64	$3\frac{1}{2}-4\frac{1}{2}$	
2502.216	A	50	3.57	8.51	$0\frac{1}{2}-1\frac{1}{2}$	$a^2S-y^2P^\circ$ (141)							
2518.43	A	30	3.57	8.47	$0\frac{1}{2}-0\frac{1}{2}$		2874.847	A	10	4.14	8.43	$3\frac{1}{2}-4\frac{1}{2}$	$c^4D-w^4F^\circ\uparrow$ (156)
2392.327	A	40	3.57	8.73	$0\frac{1}{2}-1\frac{1}{2}$	$a^2S-x^2D^\circ$ (142)	2913.74	A	40	4.18	8.42	$2\frac{1}{2}-3\frac{1}{2}$	
							2898.477	A	15	4.14	8.40	$1\frac{1}{2}-2\frac{1}{2}$	
2320.090	A	30	3.57	8.89	$0\frac{1}{2}-1\frac{1}{2}$	$a^2S-w^2D^\circ$ (143)	2944.814	A	150	4.33	8.52	$6\frac{1}{2}-7\frac{1}{2}$	$b^2I-z^2K^\circ$ (157)
							3077.660	A	250	4.37	8.38	$5\frac{1}{2}-6\frac{1}{2}$	
2216.60	A	40	3.57	9.14	$0\frac{1}{2}-1\frac{1}{2}$	$a^2S-w^2P^\circ\uparrow$ (144)	3048.888	A	50	4.33	8.38	$5\frac{1}{2}-6\frac{1}{2}$	
							2956.915	A	75	4.33	8.51	$6\frac{1}{2}-6\frac{1}{2}$	$b^2I-y^2I^\circ$ (158)
2879.046	A	100	3.75	8.04	$5\frac{1}{2}-6\frac{1}{2}$	$b^4G-y^4H^\circ\uparrow$ (145)	3023.303	A	125	4.37	8.45	$5\frac{1}{2}-5\frac{1}{2}$	
2946.692	A	125	3.73	7.92	$4\frac{1}{2}-5\frac{1}{2}$		*2995.528	A	12	4.33	8.45	$6\frac{1}{2}-5\frac{1}{2}$	
2986.147	A	100	3.71	7.84	$3\frac{1}{2}-4\frac{1}{2}$		*2983.955	A	75d	4.37	8.51	$5\frac{1}{2}-6\frac{1}{2}$	
2975.390	A	75	3.67	7.81	$2\frac{1}{2}-3\frac{1}{2}$		2214.39	A	45	5.11	10.69	$2\frac{1}{2}-3\frac{1}{2}$	$d^2D-s^2F^\circ$ (159)
2962.212	A	15	3.75	7.92	$5\frac{1}{2}-5\frac{1}{2}$								
							*2208.18§	A	40	5.11	10.70	$2\frac{1}{2}-2\frac{1}{2}$	$d^2D-t^2D^\circ$ (160)

Strongest Unclassified Lines of Mo II

Air 2987.347	A	50				Air 2511.29	A	40					
2979.787	A	35				2503.594	A	50					
2756.065	A	50				2390.783	A	50					
2606.60	A	50				2273.240	A	40					
2600.104	A	80				2235.68	A	35					
2570.847	A	50w				2230.07	A	35					
2527.25	A	40				2060.33	A	40					

Mo III

I P 27.0 Anal D List B October 1960

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- A F. R. Rico, An. Real Soc. Esp. Fys. y Quim. (Madrid) [A] 50, 185 (1954). W. L, I, T
 * and §=Blend of Mo III and Mo II
 B F. R. Rico, An. Real Soc. Esp. Fys. y Quim. (Madrid) [A] 53, 185 (1957). W. L, I

Mo III

Mo III

I A	Ref	Int	E P ¹		J	Multiplet No.	I A	Ref	Int	E P ¹		J	Multiplet No.
			Low	High						Low	High		
Vac							Air						
1274.359	B	100	(0.19)	(9.87)	4-5	4d ⁴ 5D - 5p 5F°	2253.182	A	100	(4.29)	(9.77)	5-4	5s 5F - 5p 5D°†
1278.401	B	200	(0.19)	(9.84)	4-4	(1)	*2269.708§	A	150	(4.18)	(9.62)	4-3	(4)
1288.100	B	50	(0.19)	(9.77)	4-3		*2304.262§	A	80	(4.08)	(9.44)	3-2	
							2317.914	A	30	(4.01)	(9.33)	2-1	
1288.278	B	50	(0.19)	(9.77)	4-4	4d ⁴ 5D - 5p 5D°	2323.931	A	50	(3.96)	(9.27)	1-0?	
						(2)	*2208.182§	A	40	(4.18)	(9.77)	4-4	
							2230.542	A	20	(4.08)	(9.62)	3-3	
							2272.347	A	20	(4.01)	(9.44)	2-2	
							2295.314	A	8	(3.96)	(9.33)	1-1	
							2171.108	A	25	(4.08)	(9.77)	3-4	
Air													
2294.970	A	200	(4.29)	(9.67)	5-6	5s 5F - 5p 5G°†	*2211.013	A	100	(4.29)	(9.87)	5-5	5s 5F - 5p 5F°
2330.929	A	150	(4.18)	(9.47)	4-5	(3)	*2179.366§	A	75	(4.18)	(9.84)	4-4	(5)
2359.755	A	100	(4.08)	(9.31)	3-4		2170.572	A	75	(4.08)	(9.77)	3-3	
*2386.962§	A	80	(4.01)	(9.18)	2-3		*2211.013	A	100	(4.01)	(9.59)	2-2	
2412.708	A	70	(3.96)	(9.07)	1-2		2206.060	A	18	(3.96)	(9.55)	1-1	
2381.136	A	40	(4.29)	(9.47)	5-5		2223.188	A	50	(4.29)	(9.84)	5-4	
*2403.605§	A	50	(4.18)	(9.31)	4-4		2207.622	A	20	(4.18)	(9.77)	4-3	
*2422.183§	A	50	(4.08)	(9.18)	3-3		2241.191	A	20	(4.08)	(9.59)	3-2	
2437.688	A	40	(4.01)	(9.07)	2-2		2226.927	A	40	(4.01)	(9.55)	2-1	
							2167.668	A	45	(4.18)	(9.87)	4-5	
							*2143.251§	A	40	(4.08)	(9.84)	3-4	
							2142.237	A	40	(4.01)	(9.77)	2-3	
							2190.444	A	40	(3.96)	(9.59)	1-2	

¹ Parentheses indicate that the excitation potentials have been derived from levels whose values have been estimated relative to the ground state.

Mo IV

I P 46.2 Anal D List A October 1960

REFERENCES

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 * and §=Blend of Mo III and Mo IV

Mo IV

Mo IV

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Vac							Vac						
884.786	A	10	0.35	14.30	$4\frac{1}{2}-5\frac{1}{2}$	$4d^3\ ^4F-5p\ ^4G^\circ$	1929.256	A	500	7.91	14.30	$4\frac{1}{2}-5\frac{1}{2}$	$5s\ ^4F-5p\ ^4G^\circ$
895.354	A	10	0.22	14.00	$3\frac{1}{2}-4\frac{1}{2}$	(1)	1971.092	A	500	7.74	14.00	$3\frac{1}{2}-4\frac{1}{2}$	(4)
913.900	A	10	0.00	13.51	$1\frac{1}{2}-2\frac{1}{2}$		Air						
920.496	A	20	0.10	13.51	$2\frac{1}{2}-2\frac{1}{2}$		2011.57	B	(70)	7.61	13.74	$2\frac{1}{2}-3\frac{1}{2}$	
							2061.03	B	(50)	7.52	13.51	$1\frac{1}{2}-2\frac{1}{2}$	
884.207	A	50	0.35	14.31	$4\frac{1}{2}-4\frac{1}{2}$	$4d^3\ ^4F-5p\ ^4F^\circ$	2024.43	B	(20)	7.91	14.00	$4\frac{1}{2}-4\frac{1}{2}$	
885.982	A	30	0.22	14.15	$3\frac{1}{2}-3\frac{1}{2}$	(2)	2056.29	B	(25)	7.74	13.74	$3\frac{1}{2}-3\frac{1}{2}$	
891.674	A	30	0.10	13.94	$2\frac{1}{2}-2\frac{1}{2}$		2092.54	B	(15)	7.61	13.51	$2\frac{1}{2}-2\frac{1}{2}$	
*894.762	A	20	0.00	13.80	$1\frac{1}{2}-1\frac{1}{2}$		2114.43	B	(10)	7.91	13.74	$4\frac{1}{2}-3\frac{1}{2}$	
*894.762	A	20	0.35	14.15	$4\frac{1}{2}-3\frac{1}{2}$		2140.98	B	(5)	7.74	13.51	$3\frac{1}{2}-2\frac{1}{2}$	
875.674	B	(2)	0.22	14.31	$3\frac{1}{2}-4\frac{1}{2}$								
878.402	A	5	0.10	14.15	$2\frac{1}{2}-3\frac{1}{2}$		Vac						
885.537	A	5	0.00	13.94	$1\frac{1}{2}-2\frac{1}{2}$		*1926.261	A	500	7.91	14.31	$4\frac{1}{2}-4\frac{1}{2}$	$5s\ ^4F-5p\ ^4F^\circ$
							*1926.261	A	500	7.74	14.15	$3\frac{1}{2}-3\frac{1}{2}$	(5)
867.925	A	20	0.35	14.58	$4\frac{1}{2}-3\frac{1}{2}$	$4d^3\ ^4F-5p\ ^4D^\circ$	*1949.515§	A	300	7.61	13.94	$2\frac{1}{2}-2\frac{1}{2}$	
863.209	A	10	0.22	14.52	$3\frac{1}{2}-2\frac{1}{2}$	(3)	1966.082	A	100	7.52	13.80	$1\frac{1}{2}-1\frac{1}{2}$	
863.509	A	10	0.10	14.39	$2\frac{1}{2}-1\frac{1}{2}$		1977.204	A	500	7.91	14.15	$4\frac{1}{2}-3\frac{1}{2}$	
863.623	A	10	0.00	14.29	$1\frac{1}{2}-0\frac{1}{2}$		1991.391	A	100	7.74	13.94	$3\frac{1}{2}-2\frac{1}{2}$	
859.692	A	1	0.22	14.58	$3\frac{1}{2}-3\frac{1}{2}$		1994.669	A	100	7.61	13.80	$2\frac{1}{2}-1\frac{1}{2}$	
855.968	A	3	0.10	14.52	$2\frac{1}{2}-2\frac{1}{2}$		1877.711	A	20	7.74	14.31	$3\frac{1}{2}-4\frac{1}{2}$	
857.722	A	10	0.00	14.39	$1\frac{1}{2}-1\frac{1}{2}$		1886.795	A	40	7.61	14.15	$2\frac{1}{2}-3\frac{1}{2}$	
852.636	A	2	0.10	14.58	$2\frac{1}{2}-3\frac{1}{2}?$		1922.134	A	20	7.52	13.94	$1\frac{1}{2}-2\frac{1}{2}$	
							1850.701	A	100	7.91	14.58	$4\frac{1}{2}-3\frac{1}{2}$	$5s\ ^4F-5p\ ^4D^\circ$
							*1821.641	A	100	7.74	14.52	$3\frac{1}{2}-2\frac{1}{2}$	(6)
							1819.521	A	100	7.61	14.39	$2\frac{1}{2}-1\frac{1}{2}$	
							*1821.641	A	100	7.52	14.29	$1\frac{1}{2}-0\frac{1}{2}$	
							1805.976	A	20	7.74	14.58	$3\frac{1}{2}-3\frac{1}{2}$	
							1786.420	A	20	7.61	14.52	$2\frac{1}{2}-2\frac{1}{2}$	
							1795.628	A	10	7.52	14.39	$1\frac{1}{2}-1\frac{1}{2}$	
							1771.40	B	(3)	7.61	14.58	$2\frac{1}{2}-3\frac{1}{2}$	
							1763.439	A	5	7.52	14.52	$1\frac{1}{2}-2\frac{1}{2}$	

Strongest Unclassified Lines of Mo IV

Air						Air							
1976.853	A	100				1387.212	A	50					
1974.517	A	50				1384.613	A	50					
1973.623	A	50				1355.995	A	50					
1969.212	A	50				1352.825	A	50					
1962.530	A	200				1351.259	A	50					
1954.440	A	100				1350.709	A	50					
1944.251	A	50				1346.007	A	50					
1935.866	A	100				1344.128	A	50					
1932.273	A	100				1342.757	A	50					
1930.511	A	50				1341.348	A	50					
1883.560	A	60				1339.939	A	50					
1865.980	A	60				1338.377	A	50					
1846.127	A	50				1336.696	A	50					
1845.700	A	50				1336.163	A	50					
1668.948	A	50				1318.597	A	50					
1667.480	A	70				1200.800	A	50					
1666.654	A	70				1166.070	A	50					
1665.845	A	50				1163.636	A	50					
1665.545	A	50				1109.028	A	50					
1476.859	A	50				1096.448	A	50					
1440.838	A	50				1082.551	A	50					
1406.562	A	50				1038.636	A	50					
1393.670	A	100				930.855	A	100					

Mo V

I P 61 Anal C List B October 1960

REFERENCES

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TECHNETIUM, $Z = 43$ **Tc I**

I P 7.25 Anal C List B November 1960

REFERENCES

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Tc I**Tc I**

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Air							Air						
*2896.340	A	1000	0.00	4.26	$2\frac{1}{2}-2\frac{1}{2}$	$a^6S - y^4P^0$	2802.810	A	1000	0.32	4.72	$4\frac{1}{2}-3\frac{1}{2}$	$a^6D - x^6P^0$
2860.988	A	15	0.00	4.31	$2\frac{1}{2}-1\frac{1}{2}$	(1)	2859.110	A	2000c	0.40	4.72	$3\frac{1}{2}-2\frac{1}{2}$	(3)
							2887.734	A	1000	0.46	4.73	$2\frac{1}{2}-1\frac{1}{2}$	
2614.233	A	1500	0.00	4.72	$2\frac{1}{2}-3\frac{1}{2}$	$a^6S - x^6P^0$	2857.128	A	500	0.40	4.72	$3\frac{1}{2}-3\frac{1}{2}$	
2615.873	A	1000	0.00	4.72	$2\frac{1}{2}-2\frac{1}{2}$	(2)	*2896.340	A	1000	0.46	4.72	$2\frac{1}{2}-2\frac{1}{2}$	
2608.855	A	500	0.00	4.73	$2\frac{1}{2}-1\frac{1}{2}$		2913.147	A	1000	0.49	4.73	$1\frac{1}{2}-1\frac{1}{2}$	
							2894.322	A	200	0.46	4.72	$2\frac{1}{2}-3\frac{1}{2}$	
							2921.912	A	500	0.49	4.72	$1\frac{1}{2}-2\frac{1}{2}$	
							2928.198	A	1000	0.52	4.73	$0\frac{1}{2}-1\frac{1}{2}$	

Tc II

I P 15.2 Anal C List B November 1960

REFERENCES

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 M. A. Catalán y F. R. Rico, letter (December 1956). I P
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Tc II**Tc II**

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Air							Air						
2543.227 ¹	A	5000c	0.00	4.85	3-4	$a^7S - z^7P^0$	2795.778	A	500	(2.96	7.38) ¹	6-6	$a^5G - z^5G^0$
2609.993	A	2000c	0.00	4.73	3-3	(1)	2811.614	A	1000	(2.97	7.36)	5-5	(4)
2647.011	A	3000c	0.00	4.66	3-2		2821.352	A	500	(2.96	7.33)	4-4	
							2831.180	A	600	(2.95	7.31)	3-3	
2298.080	A	30	0.00	5.37	3-3	$a^7S - z^5P^0$	2840.375	A	400	(2.94	7.29)	2-2	
2285.451	A	15	0.00	5.40	3-2	(2)	2809.646	A	150c	(2.96	7.36)	6-5	
							2825.042	A	80c	(2.97	7.33)	5-4	
							2836.117	A	150	(2.96	7.31)	4-3	
							2797.730	A	10	(2.97	7.38)	5-6	
2496.767	A	500	0.43	5.37	4-3	$a^5D - z^5P^0$	2807.915	A	15d	(2.96	7.36)	4-5	
2529.340	A	400	0.52	5.40	3-2	(3)	2816.515	A	10h	(2.95	7.33)	3-4	
2547.930	A	150	0.58	5.42	2-1		2634.909	A	1000	(2.96	7.65)	6-7	$a^5G - z^5H^0$
2544.807	A	400	0.52	5.37	3-3		2652.351	A	600	(2.97	7.62)	5-6	(5)
2558.606	A	300	0.58	5.40	2-2		2682.699	A	200cw	(2.96	7.56)	4-5	
2567.034	A	250	0.61	5.42	1-1		2725.656	A	400c	(2.95	7.48)	3-4	
2574.442	A	30c	0.58	5.37	2-3		2724.193	A	200w	(2.94	7.47)	2-3	
2577.861	A	40	0.61	5.40	1-2		2650.603	A	20h	(2.96	7.62)	6-6	
2576.281	A	90	0.63	5.42	0-1		2686.023	A	8	(2.97	7.56)	5-5	
							2730.225	A	6	(2.96	7.48)	4-4	
							2684.234	A	6	(2.96	7.56)	6-5	
							2644.496	A	500c	(2.96	7.63)	6-5	$a^5G - z^5F^0$
							2673.412	A	200	(2.97	7.58)	5-4	(6)
							2675.223	A	200c	(2.96	7.57)	4-3	
							2693.744	A	40	(2.95	7.53)	3-2	
							2711.481	A	5	(2.94	7.49)	2-1	
							2646.245	A	100	(2.97	7.63)	5-5	
							2670.110	A	20	(2.96	7.58)	4-4	
							2670.818	A	3	(2.95	7.57)	3-3	
							2688.033	A	73	(2.94	7.53)	2-2	
							2643.006	A	200	(2.96	7.63)	4-5	
							2665.733	A	70	(2.95	7.58)	3-4	

¹ Parentheses indicate that the excitation potentials have been derived from an estimated value of a^5G_0 relative to the ground state.

RUTHENIUM, $Z = 44$

Ru I

I P 7.334 Anal A List B June 1959

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K. G. Kessler and W. F. Meggers, J. Research Nat. Bur. Std. 55, 97 RP2609 (1955). W L, I

* and §=Blend with Ru II

Ru I

Ru I

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Air							Air						
2874.984	A	1000R	0.00	4.29	5-5	$a^5F - y^5F^\circ$	2655.221	A	30	0.26	4.91	3-2	$a^5F - y^3P^\circ$
2916.251	A	150	0.15	4.38	4-4	(1)	2687.138	A	40	0.34	4.93	2-1	(9)
2965.168	A	150	0.26	4.42	3-3		2717.401	A	100	0.38	4.92	1-0	
3006.588	A	300	0.34	4.44	2-2		2699.793	A	20	0.34	4.91	2-2	
3017.235	A	200	0.38	4.47	1-1		2715.773	A	75	0.38	4.93	1-1	
2818.359	A	200	0.00	4.38	5-4								
2887.993	A	70	0.15	4.42	4-3		2472.09	A	40	0.00	4.99	5-4	$a^5F - 1^\circ \dagger$
2951.401	A	60	0.26	4.44	3-2								(10)
2981.934	A	75	0.34	4.47	2-1								
2976.923	A	100	0.15	4.29	4-5		2504.51	A	20	0.26	5.19	3-2	$a^5F - x^3D^\circ \dagger$
2994.967	A	150	0.26	4.38	3-4								(11)
3020.871	A	150	0.34	4.42	2-3								
3042.480	A	100	0.38	4.44	1-2		2514.45	A	30	0.15	5.06	4-3	$a^5F - z^1F^\circ$
							2614.585	A	75	0.34	5.06	2-3	(12)
2735.727	A	250	0.00	4.51	5-4	$a^5F - x^5D^\circ \dagger$							
2763.413	A	200	0.15	4.61	4-3	(2)	2474.846	A	30	0.34	5.32	2-1	$a^5F - y^3S^\circ$
2810.029	A	150	0.26	4.65	3-2								(13)
2817.092	A	100	0.34	4.72	2-1								
2881.273	A	60	0.38	4.67	1-0		2238.35	A	50	0.00	5.51	5-4	$a^5F - y^3H^\circ \dagger$
2827.857	A	100	0.15	4.51	4-4								(14)
2833.999	A	80	0.26	4.61	3-3								
2860.014	A	100	0.34	4.65	2-2		2293.044	A	30	0.00	5.38	5-5	$a^5F - y^1H^\circ$
2848.586	A	80	0.38	4.72	1-1								(15)
m2901.816	P	Ru I	0.26	4.51	3-4								
2884.843	A	80	0.34	4.61	2-3		2285.382	A	60	0.00	5.40	5-5	$a^5F - w^3G^\circ$
							2342.72	A	80	0.15	5.42	4-4	(16)
2810.551	A	250	0.15	4.54	4-3	$a^5F - y^3D^\circ \dagger$	2349.338	A	150	0.15	5.40	4-5	
2866.653	A	150	0.26	4.56	3-2	(3)	2393.249	A	90	0.26	5.42	3-4	
2883.594	A	75	0.26	4.54	3-3								
2896.523	A	100	0.38	4.64	1-1		2450.359	A	30	0.38	5.42	1-2	$a^5F - y^1D^\circ$
2936.247	A	30	0.34	4.54	2-3								(17)
2952.489	A	80	0.38	4.56	1-2								
2854.075	A	200	0.26	4.58	3-2	$a^5F - z^3P^\circ$	2272.091	A	100	0.00	5.43	5-6	$a^5F - 2^\circ$
2886.528	A	150	0.34	4.61	2-1	(4)							(18)
2908.883	A	150	0.38	4.63	1-0		2259.529	A	100	0.00	5.46	5-4	$a^5F - w^5D^\circ$
2905.651	A	75	0.34	4.58	2-2		2278.198	A	50	0.15	5.56	4-3	(19)
2919.604	A	75	0.38	4.61	1-1		2287.695	A	60	0.26	5.65	3-2	
2939.135	A	75	0.38	4.58	1-2		2299.289	A	60	0.34	5.70	2-1	
							2305.517	A	70	0.38	5.74	1-0	
*2614.055	A	100	0.00	4.72	5-4	$a^5F - y^3F^\circ \dagger$	2322.009	A	80	0.15	5.46	4-4	
*2614.055	A	100	0.15	4.87	4-3	(5)	2325.952	A	60	0.26	5.56	3-3	
2607.348	A	50	0.26	4.99	3-2		2320.699	A	60	0.34	5.65	2-2	
							2320.23	A	40	0.38	5.70	1-1	
2570.093	A	30	0.00	4.80	5-6	$a^5F - z^3H^\circ \dagger$	2360.093	A	90	0.34	5.56	2-3	
						(6)	2342.02	A	40	0.38	5.65	1-2	
2664.761	A	100	0.15	4.78	4-3	$a^5F - y^5P^\circ \dagger$	2255.53	A	80	0.00	5.47	5-5	$a^5F - x^5F^\circ \dagger$
2707.969	A	100	0.26	4.82	3-2	(7)	2302.533	A	100	0.15	5.51	4-4	(20)
2697.510	A	50	0.34	4.91	2-1		2340.696	A	100	0.26	5.53	3-3	
2730.325	A	80	0.26	4.78	3-3		2331.43	A	60	0.34	5.63	2-2	
							2241.075	A	50	0.00	5.51	5-4	
2612.895	A	20	0.15	4.87	4-5	$a^5F - y^3G^\circ \dagger$	2292.333	A	40	0.15	5.53	4-3	
						(8)	2317.784	A	80	0.15	5.47	4-5	
							2351.33	A	200	0.26	5.51	3-4	
							2375.272	A	100	0.34	5.53	2-3	

Ru I—Continued

Ru I—Continued

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Air 2395.721	A	80	0.34	5.49	2-3	$a^5F - 4^\circ$ (21)	Air 2879.358	A	25	1.13	5.42	2-2	$a^3F - y^1D^\circ$ (41)
2335.738	A	40	0.26	5.54	3-2	$a^5F - 5^\circ$	2651.839	A	30	0.81	5.46	4-4	$a^3F - w^5D^\circ$
2370.169	A	80	0.34	5.54	2-2	(22)	2702.833	A	80	1.00	5.56	3-3	(42)
2392.425	A	150	0.38	5.54	1-2		2730.932	A	100	1.13	5.65	2-2	
							2594.855	A	100	0.81	5.56	4-3	
2318.905	A	40	0.26	5.58	3-3	$a^5F - x^1F^\circ$ (23)	2651.289	A	40	1.00	5.65	3-2	
							2701.337	A	70	1.13	5.70	2-1	
							2764.714	A	70	1.00	5.46	3-4	
2254.71	A	30	0.15	5.62	4-4	$a^5F - x^1G^\circ \dagger$ (24)	2785.649	A	80	1.13	5.56	2-3	
							2846.750	A	30	1.13	5.47	2-1	$a^3F - 3^\circ$ (43)
2253.65	A	50	0.15	5.62	4-3	$a^5F - 7^\circ$ (25)	2626.478	A	50	0.81	5.51	4-4	$a^3F - x^5F^\circ \dagger$ (44)
2243.23	A	60	0.15	5.65	4-4	$a^5F - w^3F^\circ \dagger$	2693.653	A	30	1.00	5.58	3-2	$a^3F - y^5S^\circ$ (45)
2264.696	A	20	0.38	5.83	1-2	(26)	2575.242	A	30	0.81	5.60	4-4	$a^3F - y^1G^\circ$ (46)
2331.770	A	40	0.38	5.68	1-1	$a^5F - 8^\circ$ (27)	2567.893	A	40	0.81	5.61	4-3	$a^3F - 6^\circ$
2227.640	A	25	0.15	5.69	4-4	$a^5F - 10^\circ \dagger$ (28)	2673.605	A	80	1.00	5.61	3-3	(47)
2256.187	A	40	0.26	5.73	3-4	$a^5F - 13^\circ \dagger$ (29)	*2754.603	A	60	1.13	5.61	2-3	
2194.428	A	15	0.15	5.77	4-3	$a^5F - x^5P^\circ \dagger$	2668.342	A	40	1.00	5.62	3-3	$a^3F - 7^\circ \dagger$ (48)
2235.836	A	25	0.26	5.78	3-2	(30)	2549.56	A	300	0.81	5.65	4-4	$a^3F - w^3F^\circ \dagger$
2232.08	A	30	0.34	5.86	2-1		2572.412	A	100	1.00	5.80	3-3	(49)
2270.322	A	20	0.34	5.77	2-3		2626.356	A	20	1.13	5.83	2-2	
2268.34	A	40	0.38	5.82	1-0	$a^5F - 18^\circ$ (31)	2647.314	A	75	1.13	5.80	2-3	
2209.08	A	40	0.26	5.84	3-2	$a^5F - 20^\circ \dagger$ (32)	2717.001	A	30	1.13	5.68	2-1	$a^3F - 8^\circ$ (50)
							*2609.062	A	125	1.00	5.73	3-4	$a^3F - 13^\circ ?$ (51)
2934.173	A	75	0.81	5.01	4-5	$a^3F - z^1H^\circ$ (33)	2502.37	A	25	0.81	5.74	4-5	$a^3F - x^1H^\circ$ (52)
2861.408	A	125	0.81	5.12	4-3	$a^3F - w^3D^\circ$	2676.969	A	20	1.13	5.74	2-1	$a^3F - y^1P^\circ$ (53)
2901.937	A	50	1.00	5.25	3-2	(34)	2489.92	A	70	0.81	5.76	4-4	$a^3F - 14^\circ$ (54)
2993.273	A	100	1.00	5.12	3-3		2581.911	A	50	1.00	5.78	3-2	$a^3F - x^5P^\circ \dagger$
2997.613	A	50	1.13	5.25	2-2		2585.739	A	30	1.00	5.77	3-3	(55)
*2743.934§	A	80	0.81	5.31	4-5	$a^3F - z^3I^\circ$ (35)	2658.391	A	80	1.13	5.78	2-1	$a^3F - 15^\circ$ (56)
2840.537	A	80	0.81	5.15	4-5	$a^3F - x^3G^\circ$	2640.324	A	60	1.13	5.81	2-3	$a^3F - 16^\circ \dagger$ (57)
2868.183	A	25	1.00	5.30	3-4	(36)	2558.540	A	100	1.00	5.82	3-4	$a^3F - 17^\circ$ (58)
2873.370	A	50	1.13	5.43	2-3		2551.72	A	60	1.00	5.83	3-4	$a^3F - 19^\circ \dagger$ (59)
2746.885	A	75	0.81	5.30	4-4		2450.560	A	100	0.81	5.84	4-3	$a^3F - s^3D^\circ \dagger$
2785.334	A	75	1.00	5.43	3-3		*2533.23	A	100	1.00	5.87	3-2	(60)
2968.952	A	100	1.00	5.16	3-2	$a^3F - z^1D^\circ$	2546.668	A	150	1.00	5.84	3-3	
3069.181	A	50	1.13	5.16	2-2	(37)	2605.853	A	100	1.13	5.87	2-2	
2829.149	A	200	0.81	5.17	4-3	$a^3F - v^3D^\circ$	2619.666	A	50	1.13	5.84	2-2	$a^3F - 20^\circ \dagger$ (61)
2871.642	A	100	1.00	5.30	3-2	(38)	2445.43	A	50	0.81	5.86	4-5	$a^3F - 21^\circ$ (62)
2957.996	A	100	1.00	5.17	3-3								
2863.324	A	20	1.00	5.31	3-3	$a^3F - y^1F^\circ$ (39)							
2822.034	A	100	1.00	5.37	3-2	$a^3F - u^3D^\circ$							
2884.500	A	50	1.13	5.41	2-1	(40)							
2912.433	A	50	1.13	5.37	2-2								

Ru I—Continued

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Air							Air						
2432.915	A	90	0.81	5.88	4-3	$a^3F - 23^\circ \dagger$ (63)	2719.51	A	250	0.92	5.46	4-4	$a^5D - w^5D^\circ$ (85)
2423.877	A	30	0.81	5.90	4-3	$a^3F - 25^\circ$	2739.217	A	150	1.06	5.56	3-3	
2589.569	A	150	1.13	5.90	2-3	$a^3F - 25^\circ$ (64)	2721.562	A	70	1.12	5.65	2-2	
2419.205	A	30	0.81	5.91	4-3	$a^3F - 28^\circ$	2693.30	A	150	1.12	5.70	1-1	
2512.81	A	100	1.00	5.91	3-3	$a^3F - 28^\circ$ (65)	2659.617	A	100	0.92	5.56	4-3	
2405.180	A	50	0.81	5.94	4-4	$a^3F - 30^\circ$	2686.291	A	175	1.06	5.65	3-2	
2497.680	A	40	1.00	5.94	3-4	$a^3F - 30^\circ$ (66)	2673.477	A	80	1.12	5.74	1-0	
2403.173	A	25	0.81	5.94	4-4	$a^3F - 31^\circ$ (67)	2802.805	A	125	1.06	5.46	3-4	
2467.576	A	40	1.00	6.00	3-4	$a^3F - 38^\circ$ (68)	2775.902	A	80	1.12	5.56	2-3	
2525.63	A	50	1.13	6.02	2-3	$a^3F - 40^\circ \dagger$ (69)	2722.693	A	50	1.12	5.65	1-2	
2434.879	A	40	1.00	6.07	3-3	$a^3F - 46^\circ$	2724.066	A	100	1.17	5.70	0-1	
2501.885	A	60	1.13	6.07	2-3	$a^3F - 46^\circ$ (70)	2836.569	A	70	1.12	5.47	2-1	$a^5D - 3^\circ \dagger$ (86)
2433.477	A	25	1.00	6.07	3-4	$a^3F - 47^\circ$ (71)	2713.728	A	50	0.92	5.47	4-5	$a^5D - x^5F^\circ \dagger$ (87)
2491.76	A	60	1.13	6.09	2-3	$a^3F - 48^\circ \dagger$ (72)	2774.480	A	125	1.06	5.51	3-4	
2294.054	A	50	0.81	6.19	4-5	$a^3F - v^3G^\circ$	2737.463	A	20	1.12	5.63	1-2	
2387.881	A	100	1.00	6.17	3-4	$a^3F - v^3G^\circ$ (73)	2692.842	A	80	0.92	5.51	4-4	
2437.790	A	50	1.13	6.20	2-1	$a^3F - 57^\circ$ (74)	2759.682	A	100	1.06	5.53	3-3	
							2700.671	A	25	1.06	5.63	3-2	
							2766.223	A	50	1.12	5.58	2-2	$a^5D - y^5S^\circ \dagger$ (88)
							2650.395	A	30	0.92	5.58	4-3	$a^5D - x^1F^\circ \dagger$ (89)
							2729.455	A	60	1.06	5.58	3-3	
							2631.304	A	100	0.92	5.61	4-3	$a^5D - 6^\circ$ (90)
							2709.198	A	125	1.06	5.61	3-3	
							2745.074	A	75	1.12	5.61	2-3	
							2627.650	A	100	0.92	5.62	4-4	$a^5D - x^1G^\circ \dagger$ (91)
							2626.205	A	30	0.92	5.62	4-3	$a^5D - 7^\circ$ (92)
							2703.796	A	50	1.06	5.62	3-3	
*2909.212	A	30	1.06	5.30	3-4	$a^5D - x^3G^\circ \dagger$	2612.06	A	150	0.92	5.65	4-4	$a^5D - w^3F^\circ$ (93)
2863.003	A	30	1.12	5.43	2-3	$a^5D - x^3G^\circ \dagger$ (75)	2605.347	A	100	1.06	5.80	3-3	
2906.315	A	60	0.92	5.17	4-3	$a^5D - v^3D^\circ$	2617.677	A	20	1.12	5.83	2-2	
2912.745	A	10	1.06	5.30	3-2	$a^5D - v^3D^\circ$ (76)	*2533.23	A	100	0.92	5.80	4-3	
3001.634	A	60	1.06	5.17	3-3		2638.515	A	75	1.12	5.80	2-3	
*3045.715	A	125	1.12	5.17	2-3		2618.737	A	20	1.12	5.83	1-2	
2955.593	A	20	1.12	5.30	1-2		2708.841	A	25	1.12	5.68	1-1	$a^5D - 8^\circ \dagger$ (94)
2996.891	A	75	1.12	5.24	2-1	$a^5D - z^1P^\circ$							
*3036.463§	A	40	1.17	5.24	0-1	$a^5D - z^1P^\circ$ (77)	2651.874	A	25	1.06	5.71	3-4	$a^5D - 12^\circ$ (95)
2814.862	A	25	0.92	5.31	4-3	$a^5D - y^1F^\circ \dagger$ (78)	2568.772	A	75	0.92	5.73	4-4	$a^5D - 13^\circ$ (96)
2936.005	A	60	1.12	5.32	2-1	$a^5D - y^3S^\circ$	2642.946	A	200	1.06	5.73	3-4	
2937.336	A	30	1.12	5.32	1-1	$a^5D - y^3S^\circ$ (79)	2667.969	A	50	1.12	5.74	2-1	$a^5D - y^1P^\circ \dagger$ (97)
2973.976	A	100	1.17	5.32	0-1								
2861.718	A	40	1.06	5.37	3-2	$a^5D - u^3D^\circ \dagger$	2549.470	A	300	0.92	5.76	4-4	$a^5D - 14^\circ$ (98)
2874.050	A	25	1.12	5.41	2-1	$a^5D - u^3D^\circ \dagger$ (80)							
2901.784	A	25	1.12	5.37	2-2		2546.14	A	15	0.92	5.77	4-3	$a^5D - x^5P^\circ$ (99)
2903.074	A	40	1.12	5.37	1-2		2615.093	A	75	1.06	5.78	3-2	
2910.425	A	20	1.17	5.41	0-1		2619.014	A	70	1.06	5.77	3-3	
2770.296	A	50	1.06	5.51	3-4	$a^5D - y^3H^\circ$	2649.575	A	20	1.12	5.78	1-2	
2688.888	A	70	0.92	5.51	4-4	$a^5D - y^3H^\circ$ (81)	2630.231	A	160	1.17	5.86	0-1?	
2757.064	A	30	0.92	5.40	4-5	$a^5D - w^3G^\circ$	2649.506	A	25	1.12	5.78	2-1	$a^5D - 15^\circ \dagger$ (100)
*2747.963§	A	40	0.92	5.42	4-4	$a^5D - w^3G^\circ$ (82)							
2870.213	A	40	1.12	5.42	1-2	$a^5D - y^1D^\circ \dagger$ (83)	2526.82	A	200	0.92	5.81	4-3	$a^5D - 16^\circ$ (101)
2803.496	A	40	1.06	5.46	3-2	$a^5D - x^3P^\circ \dagger$	2598.574	A	20	1.06	5.81	3-3	
2843.170	A	70	1.12	5.46	1-2	$a^5D - x^3P^\circ \dagger$ (84)	2631.569	A	100	1.12	5.81	2-3	
							2591.116	A	100	1.06	5.82	3-4	$a^5D - 17^\circ$ (102)
							2584.136	A	100	1.06	5.83	3-4	$a^5D - 19^\circ \dagger$ (103)

Ru I—Continued

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Air							Air						
2508.270	A	100	0.92	5.84	4-3	$a^5D - s^3D^\circ$	2782.205	A	80	0.99	5.43	2-3	$a^5P - x^3G^\circ \uparrow$
2565.188	A	20	1.06	5.87	3-2	(104)							(128)
2578.948	A	20	1.06	5.84	3-3		2868.310	A	30	0.99	5.30	2-2	$a^5P - v^3D^\circ \uparrow$
2597.322	A	75	1.12	5.87	2-2		2929.434	A	40	1.08	5.30	3-2	(129)
2598.361	A	25	1.12	5.87	1-2		2877.826	A	50	1.08	5.37	3-2	$a^5P - u^3D^\circ \uparrow$
2578.571	A	100	1.06	5.84	3-2	$a^5D - 20^\circ$	2792.641	A	75	0.99	5.41	2-1	(130)
2611.045	A	80	1.12	5.84	2-2	(105)	2818.809	A	40	0.99	5.37	2-2	
2496.56	A	50	0.92	5.87	4-3	$a^5D - 22^\circ \uparrow$	2845.537	A	25	1.08	5.42	3-2	$a^5P - y^1D^\circ$
*2566.590§	A	30	1.06	5.87	3-3	(106)							(131)
2489.77	A	30	0.92	5.88	4-3	$a^5D - 23^\circ \uparrow$	2818.950	A	75	1.08	5.46	3-2	$a^5P - x^3P^\circ$
						(107)	2762.304	A	100	0.99	5.46	2-2	(132)
2480.298	A	15	0.92	5.90	4-3	$a^5D - 25^\circ$	2699.882	A	40	0.99	5.56	2-3	$a^5P - w^5D^\circ \uparrow$
2581.140	A	125	1.12	5.90	2-3	(108)	2763.900	A	50	1.19	5.65	1-2	(133)
2580.803	A	100	1.12	5.90	1-1	$a^5D - 26^\circ \uparrow$	2648.451	A	50	0.99	5.65	2-2	
*2609.062	A	125	1.17	5.90	0-1	(109)	2733.578	A	125	1.19	5.70	1-1	
2475.395	A	200	0.92	5.91	4-3	$a^5D - 28^\circ$	2700.477	A	30	1.08	5.65	3-2	
2544.22	A	300	1.06	5.91	3-3	(110)	2620.607	A	80	0.99	5.70	2-1	
2460.73	A	30	0.92	5.94	4-4	$a^5D - 30^\circ$	2713.192	A	75	1.19	5.74	1-0	
2528.71	A	50	1.06	5.94	3-4	(111)	2744.448	A	125	1.08	5.58	3-2	$a^5P - y^5S^\circ \uparrow$
2458.622	A	100	0.92	5.94	4-4	$a^5D - 31^\circ$							(134)
						(112)	2690.382	A	40	0.99	5.58	2-3	$a^5P - x^1F^\circ$
2525.17	A	30	1.06	5.95	3-2	$a^5D - 32^\circ$							(135)
2556.316	A	50	1.12	5.95	2-2	(113)	2731.903	A	30	1.08	5.60	3-4	$a^5P - y^1G^\circ$
2545.76	A	30	1.12	5.97	2-2	$a^5D - 33^\circ \uparrow$							(136)
						(114)	2569.729	A	50	0.99	5.80	2-3	$a^5P - w^3F^\circ \uparrow$
2442.934	A	50	0.92	5.98	4-3	$a^5D - 34^\circ$	2549.965	A	30	0.99	5.83	2-2	(137)
						(115)	*2690.810	A	25	1.08	5.67	3-2	$a^5P - t^3D^\circ \uparrow$
2431.51	A	40	0.92	6.00	4-4	$a^5D - 38^\circ$							(138)
2497.866	A	30	1.06	6.00	3-4	(116)	2629.925	A	40	0.99	5.69	2-1	$a^5P - 9^\circ$
2528.874	A	75	1.12	6.00	1-1	$a^5D - 39^\circ$							(139)
2556.004	A	40	1.17	6.00	0-1	(117)	2740.217	A	50	1.19	5.69	1-0	$a^5P - 11^\circ$
2517.62	A	80	1.12	6.02	2-3	$a^5D - 40^\circ \uparrow$							(140)
						(118)	2665.719	A	25	1.08	5.71	3-4	$a^5P - 12^\circ$
2470.71	A	30	1.06	6.05	3-2	$a^5D - 44^\circ \uparrow$							(141)
2501.48	A	70	1.12	6.05	1-2	(119)	2656.698	A	75	1.08	5.73	3-4	$a^5P - 13^\circ$
2500.835	A	30	1.12	6.06	1-1	$a^5D - 45^\circ \uparrow$							(142)
						(120)	2708.635	A	25	1.19	5.74	1-1	$a^5P - y^1P^\circ \uparrow$
2399.750	A	80	0.92	6.07	4-3	$a^5D - 46^\circ$							(143)
2464.366	A	20	1.06	6.07	3-3	(121)	2632.496	A	75	1.08	5.77	3-3	$a^5P - x^5P^\circ \uparrow$
2494.022	A	80	1.12	6.07	2-3		2579.222	A	70	0.99	5.78	2-2	(144)
2462.943	A	100	1.06	6.07	3-4	$a^5D - 47^\circ \uparrow$	2639.121	A	75	1.19	5.86	1-1	
						(122)	2628.536	A	25	1.08	5.78	3-2	
2366.743	A	25	0.92	6.14	4-4	$a^5D - 52^\circ$	2583.033	A	70	0.99	5.77	2-3	
2429.594	A	80	1.06	6.14	3-4	(123)	2688.583	A	50	1.19	5.78	1-2	
2415.005	A	20	1.06	6.17	3-2	$a^5D - 55^\circ \uparrow$	2563.157	A	50	0.99	5.81	2-3	$a^5P - 16^\circ$
2444.38	A	60	1.12	6.17	1-2	(124)							(145)
2456.279	A	30	1.17	6.20	0-1	$a^5D - 57^\circ$	2604.315	A	30	1.08	5.82	3-4	$a^5P - 17^\circ$
						(125)	2661.861	A	50	1.19	5.82	1-0	(146)
2422.574	A	50	1.12	6.21	1-1	$a^5D - 58^\circ$							$a^5P - 18^\circ$
2447.439	A	40	1.17	6.21	0-1	(126)	2592.022	A	100	1.08	5.84	3-3	(147)
2392.963	A	60	1.06	6.22	3-3	$a^5D - 59^\circ \uparrow$	2530.64	A	75	0.99	5.87	2-2	$a^5P - s^3D^\circ$
						(127)	*2635.861§	A	20	1.19	5.87	1-2	(148)
							2591.637	A	40	1.08	5.84	3-2	$a^5P - 20^\circ \uparrow$
							2543.67	A	50	0.99	5.84	2-2	(149)

Ru I—Continued

Ru I—Continued

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Air							Air						
2579.536	A	100	1.08	5.87	3-3	$a^5P -22^\circ \dagger$ (150)	2539.09	A	25	1.13	5.99	4-3	$b^3F -35^\circ$ (175)
2572.282	A	100	1.08	5.88	3-3	$a^5P -23^\circ$ (151)	2521.61	A	80	1.13	6.02	4-3	$b^3F -40^\circ$ (176)
2515.27	A	80	0.99	5.90	2-3	$a^5P -25^\circ \dagger$ (152)	2510.965	A	50	1.13	6.04	4-3	$b^3F -43^\circ \dagger$ (177)
2617.790	A	70	1.19	5.90	1-1	$a^5P -26^\circ \dagger$ (153)	2666.829	A	20	1.41	6.04	2-3	$b^3F -43^\circ \dagger$ (177)
2560.265	A	125	1.08	5.90	3-4	$a^5P -27^\circ$ (154)	2597.517	A	25	1.32	6.07	3-3	$b^3F -46^\circ \dagger$ (178)
2541.28	A	70	1.08	5.94	3-4	$a^5P -30^\circ$ (155)	2633.446	A	80	1.41	6.10	2-1	$b^3F -49^\circ$ (179)
2476.869	A	100	0.99	5.98	2-3	$a^5P -34^\circ \dagger$ (156)	2579.022	A	40	1.32	6.10	3-2	$b^3F -50^\circ$ (180)
2471.48	A	50	0.99	5.99	2-3	$a^5P -35^\circ \dagger$ (157)	2902.087	A	50	1.31	5.56	2-3	$a^3P -w^5D^\circ \dagger$ (181)
2510.13	A	30	1.08	6.00	3-4	$a^5P -38^\circ$ (158)	2939.938	A	80	1.46	5.65	1-2	
2464.699	A	100	0.99	6.00	2-1	$a^5P -39^\circ \dagger$ (159)	2902.854	A	25	1.45	5.70	0-1	
2454.926	A	150	0.99	6.02	2-3	$a^5P -40^\circ$ (160)	2842.749	A	20	1.31	5.65	2-2	
2444.828	A	30	0.99	6.04	2-3	$a^5P -43^\circ$ (161)	2810.695	A	20	1.31	5.70	2-1	
2476.32	A	50	1.08	6.07	3-3	$a^5P -46^\circ$ (162)	2968.468	A	30	1.31	5.47	2-1	$a^3P -3^\circ$ (182)
2474.029	A	80	1.19	6.18	1-2	$a^5P -56^\circ \dagger$ (163)	2925.067	A	20	1.31	5.53	2-3	$a^3P -x^5F^\circ \dagger$ (183)
2939.676	A	25	1.32	5.51	3-4	$b^3F -y^3H^\circ \dagger$ (164)	2992.120	A	40	1.46	5.58	1-2	$a^3P -y^5S^\circ$ (184)
2899.716	A	50	1.13	5.38	4-5	$b^3F -y^1H^\circ$ (165)	2891.130	A	50	1.31	5.58	2-3	$a^3P -x^1F^\circ$ (185)
2846.318	A	60	1.13	5.46	4-4	$b^3F -w^5D^\circ \dagger$ (166)	2752.262	A	60	1.31	5.80	2-3	$a^3P -w^3F^\circ$ (186)
2780.759	A	70	1.13	5.56	4-3	$b^3F -x^1F^\circ$ (167)	2928.487	A	50	1.46	5.67	1-2	$a^3P -t^3D^\circ \dagger$ (187)
2770.698	A	100	1.13	5.58	4-3	$b^3F -x^1F^\circ$ (167)	2877.092	A	40	1.45	5.74	0-1	
2893.731	A	20	1.32	5.58	3-3	$b^3F -w^3F^\circ$ (168)	2920.949	A	30	1.45	5.68	0-1	$a^3P -8^\circ \dagger$ (188)
2961.685	A	75	1.41	5.58	2-3	$b^3F -12^\circ$ (169)	2917.132	A	40	1.46	5.69	1-1	$a^3P -9^\circ \dagger$ (189)
2728.836	A	80	1.13	5.65	4-4	$b^3F -13^\circ$ (170)	2914.294	A	50	1.45	5.69	0-1	
*2754.603	A	60	1.32	5.80	3-3	$b^3F -16^\circ$ (171)	2913.163	A	60	1.46	5.69	1-0	$a^3P -11^\circ$ (190)
*2690.810	A	25	1.13	5.71	4-4	$b^3F -17^\circ$ (172)	2767.516	A	50 _w	1.31	5.77	2-3	$a^3P -x^5P^\circ \dagger$ (191)
2796.697	A	40	1.32	5.73	3-4	$b^3F -25^\circ \dagger$ (173)	2796.543	A	20	1.45	5.86	0-1	
2808.221	A	50	1.41	5.81	2-3	$b^3F -33^\circ \dagger$ (174)	2763.133	A	60	1.31	5.78	2-2	
2628.262	A	25	1.13	5.82	4-4		2856.044	A	30	1.46	5.78	1-1	$a^3P -15^\circ \dagger$ (192)
2585.340	A	25	1.13	5.90	4-3		2795.508	A	30	1.46	5.87	1-2	$a^3P -s^3D^\circ \dagger$ (193)
2653.693	A	25	1.32	5.97	3-2		2707.477	A	70	1.31	5.87	2-2	
							2689.894	A	70	1.31	5.90	2-3	$a^3P -25^\circ$ (194)
							2775.175	A	70	1.46	5.90	1-1	$a^3P -26^\circ$ (195)
							2772.608	A	100	1.45	5.90	0-1	
							2748.045	A	40	1.46	5.95	1-2	$a^3P -32^\circ$ (196)
							2646.002	A	75	1.31	5.98	2-3	$a^3P -34^\circ$ (197)

Ru I—Continued

Ru I—Continued

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Air 2632.127 2715.233	A A	75 40	1.31 1.46	6.00 6.00	2-1 1-1	$a^3P - 39^\circ$ (198)	Air 2408.290	A	60	1.51	6.63	5-4	$a^3G - 62^\circ \dagger$ (214)
2609.476	A	75	1.31	6.04	2-3	$a^3P - 43^\circ$ (199)	2978.361	A	30	1.73	6.87	1-2	$b^3P - s^3D^\circ \dagger$ (215)
2683.676	A	60	1.46	6.05	1-2	$a^3P - 44^\circ$ (200)	2966.549	A	20	1.68	5.84	2-2	$b^3P - 20^\circ$ (216)
2657.163	A	75	1.46	6.10	1-1	$a^3P - 49^\circ \dagger$ (201)	*2846.537	A	20	1.68	6.02	2-3	$b^3P - 40^\circ$ (217)
2654.804	A	20	1.45	6.10	0-1		2794.678	A	20	1.68	6.10	2-2	$b^3P - 50^\circ$ (218)
2576.954	A	20	1.31	6.10	2-2	$a^3P - 50^\circ$ (202)	2821.171	A	30	1.73	6.10	1-2	
2656.563	A	75	1.46	6.10	1-2								
2915.614	A	25	1.51	5.74	5-5	$a^3G - x^1H^\circ$ (203)	2927.119	A	60	1.82	6.03	4-4	$a^1G - 42^\circ$ (219)
2968.398	A	30	1.58	5.74	4-5		2920.254	A	20	1.82	6.04	4-3	$a^1G - 43^\circ$ (220)
2860.369	A	20	1.51	5.82	5-4	$a^3G - 17^\circ \dagger$ (204)	2836.143	A	50	1.82	6.17	4-4	$a^1G - v^3G^\circ$ (221)
2895.802	A	15	1.58	5.84	4-3	$a^3G - s^3D^\circ$ (205)	2726.969	A	50	1.82	6.34	4-4	$a^1G - 61^\circ$ (222)
2971.757	A	25	1.69	5.84	3-3		*2909.212	A	30	1.86	6.10	2-2	$a^3D - 50^\circ \dagger$ (223)
2838.615	A	25	1.51	5.86	5-5	$a^3G - 21^\circ$ (206)	2842.527	A	20	2.00	6.34	3-4	$a^3D - 61^\circ$ (224)
2888.624	A	50	1.58	5.86	4-5		2623.824	A	75	2.00	6.67	3-3	$a^3D - 63^\circ$ (225)
2955.348	A	50	1.69	5.87	3-3	$a^3G - 22^\circ \dagger$ (207)							
2871.186	A	40	1.58	5.88	4-3	$a^3G - 23^\circ$ (208)	*2846.537	A	20	2.00	6.34	5-4	$a^3H - 61^\circ$ (226)
*2784.516§	A	30	1.51	5.94	5-4	$a^3G - 30^\circ$ (209)	2684.089	A	60	2.10	6.67	2-3	$a^1D - 63^\circ$ (227)
2832.624	A	40	1.58	5.94	4-4								
2750.345	A	50	1.58	6.07	4-4	$a^3G - 47^\circ \dagger$ (210)							
2760.155	A	30	1.69	6.16	3-3	$a^3G - 54^\circ$ (211)							
2636.663	A	75	1.51	6.19	5-5	$a^3G - v^3G^\circ$ (212)							
2692.251	A	50	1.58	6.17	4-4								
*2648.782§	A	40	1.51	6.17	5-4								
2679.763	A	50	1.58	6.19	4-5								
2757.798	A	80	1.69	6.17	3-4								
2593.700	A	50	1.58	6.34	4-4	$a^3G - 61^\circ \dagger$ (213)							

Strongest Unclassified Lines of Ru I

Air 2812.817 2753.433 2735.669 2601.456	A A A A	100 125 250 100					Air 2570.973 2560.845 2420.826 2279.584	A A A A	100 125 200 150				
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Ru II

I P 16.69 Anal A List B March 1959

REFERENCE

- A A. G. Shenstone and W. F. Meggers, J. Research Nat. Bur. Std. **61**, 373, RP2908, 1958. I P, W L, I, T
* and §=Blend with Ru I

Ru II

Ru II

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Air							Vac						
2140.120	A	30	0.00	5.77	$4\frac{1}{2}-3\frac{1}{2}$	$a^4F - z \ ^6D^\circ \uparrow$	*1507.429	A	100d?	0.00	8.19	$4\frac{1}{2}-3\frac{1}{2}$	$a^4F - y \ ^4D^\circ \uparrow$
2184.536	A	10	0.19	5.84	$3\frac{1}{2}-2\frac{1}{2}$	(1)	1486.957	A	500	0.19	8.49	$3\frac{1}{2}-2\frac{1}{2}$	(15)
2026.838	A	100	0.19	6.28	$3\frac{1}{2}-4\frac{1}{2}$	$a^4F - z \ ^6F^\circ \uparrow$	1535.426	A	50	0.19	8.23	$3\frac{1}{2}-2\frac{1}{2}$	$a^4F - x \ ^4D^\circ \uparrow$
Vac						(2)	1547.756	A	30	0.31	8.28	$2\frac{1}{2}-1\frac{1}{2}$	(16)
1966.746	A	200	0.00	6.28	$4\frac{1}{2}-4\frac{1}{2}$		1538.624	A	30	0.38	8.41	$1\frac{1}{2}-0\frac{1}{2}$	
1966.076	A	200	0.00	6.28	$4\frac{1}{2}-3\frac{1}{2}$		1521.238	A	25	0.31	8.42	$2\frac{1}{2}-3\frac{1}{2}$	
Air													
2013.189	A	30	0.19	6.32	$3\frac{1}{2}-2\frac{1}{2}$		1479.242	A	50	0.00	8.34	$4\frac{1}{2}-5\frac{1}{2}$	$a^4F - y \ ^4G^\circ$
2047.561	A	30	0.31	6.34	$2\frac{1}{2}-1\frac{1}{2}$		1523.408	A	5	0.19	8.29	$3\frac{1}{2}-4\frac{1}{2}$	(17)
2070.768	A	15	0.38	6.34	$1\frac{1}{2}-0\frac{1}{2}$		1534.860	A	20	0.31	8.35	$2\frac{1}{2}-3\frac{1}{2}$	
Vac							1542.188	A	15	0.38	8.39	$1\frac{1}{2}-2\frac{1}{2}$	
1939.911	A	5	0.00	6.36	$4\frac{1}{2}-3\frac{1}{2}$	$a^4F - z \ ^6P^\circ \uparrow$	1488.855	A	1000	0.00	8.29	$4\frac{1}{2}-4\frac{1}{2}$	
1949.423	A	15	0.19	6.52	$3\frac{1}{2}-2\frac{1}{2}$	(3)	1512.325	A	30	0.19	8.35	$3\frac{1}{2}-3\frac{1}{2}$	
1998.988	A	30	0.19	6.36	$3\frac{1}{2}-3\frac{1}{2}$		1527.813	A	30	0.31	8.39	$2\frac{1}{2}-2\frac{1}{2}$	
1888.045	A	500	0.00	6.54	$4\frac{1}{2}-4\frac{1}{2}$	$a^4F - z \ ^4F^\circ$	1481.435	A	100	0.00	8.33	$4\frac{1}{2}-5\frac{1}{2}$	$a^4F - z \ ^2H^\circ \uparrow$
1897.437	A	100	0.19	6.69	$3\frac{1}{2}-3\frac{1}{2}$	(4)	1467.977	A	100	0.00	8.41	$4\frac{1}{2}-4\frac{1}{2}$	(18)
1912.036	A	50	0.31	6.76	$2\frac{1}{2}-2\frac{1}{2}$		1472.717	A	500	0.00	8.38	$4\frac{1}{2}-4\frac{1}{2}$	$a^4F - x \ ^4F^\circ$
1918.650	A	50	0.38	6.82	$1\frac{1}{2}-1\frac{1}{2}$		1473.151	A	400	0.19	8.57	$3\frac{1}{2}-3\frac{1}{2}$	(19)
1844.138	A	200	0.00	6.69	$4\frac{1}{2}-3\frac{1}{2}$		1489.136	A	500	0.31	8.60	$2\frac{1}{2}-2\frac{1}{2}$	
1877.186	A	100	0.19	6.76	$3\frac{1}{2}-2\frac{1}{2}$		1503.401	A	30	0.38	8.60	$1\frac{1}{2}-1\frac{1}{2}$	
1896.441	A	100	0.31	6.82	$2\frac{1}{2}-1\frac{1}{2}$		1440.820	A	5	0.00	8.57	$4\frac{1}{2}-3\frac{1}{2}$	
1943.966	A	20	0.19	6.54	$3\frac{1}{2}-4\frac{1}{2}$		1467.933	A	30	0.19	8.60	$3\frac{1}{2}-2\frac{1}{2}$	
1933.055	A	15	0.31	6.69	$2\frac{1}{2}-3\frac{1}{2}$		1489.734	A	20	0.31	8.60	$2\frac{1}{2}-1\frac{1}{2}$	
1934.615	A	20	0.38	6.76	$1\frac{1}{2}-2\frac{1}{2}$		1506.515	A	50	0.19	8.38	$3\frac{1}{2}-4\frac{1}{2}$	
1875.564	A	500	0.00	6.58	$4\frac{1}{2}-3\frac{1}{2}$	$a^4F - z \ ^4D^\circ$	1494.524	A	500	0.31	8.57	$2\frac{1}{2}-3\frac{1}{2}$	
1903.227	A	500	0.19	6.67	$3\frac{1}{2}-2\frac{1}{2}$	(5)	1502.802	A	30	0.38	8.60	$1\frac{1}{2}-2\frac{1}{2}$	
1916.829	A	200	0.31	6.75	$2\frac{1}{2}-1\frac{1}{2}$		1445.491	A	15	0.00	8.54	$4\frac{1}{2}-4\frac{1}{2}$	$a^4F - y \ ^2G^\circ$
1927.623	A	100	0.38	6.79	$1\frac{1}{2}-0\frac{1}{2}$		1498.289	A	50	0.19	8.43	$3\frac{1}{2}-3\frac{1}{2}$	(20)
1930.717	A	100	0.19	6.58	$3\frac{1}{2}-3\frac{1}{2}$		1464.855	A	15	0.00	8.43	$4\frac{1}{2}-3\frac{1}{2}$	
1939.056	A	200	0.31	6.67	$2\frac{1}{2}-2\frac{1}{2}$		1478.021	A	30	0.19	8.54	$3\frac{1}{2}-4\frac{1}{2}$	
1939.521	A	200	0.38	6.75	$1\frac{1}{2}-1\frac{1}{2}$		1520.406	A	16	0.31	8.43	$2\frac{1}{2}-3\frac{1}{2}$	
1967.610	A	20	0.31	6.58	$2\frac{1}{2}-3\frac{1}{2}$		1463.515	A	30	0.00	8.44	$4\frac{1}{2}-5\frac{1}{2}$	$a^4F - x \ ^4G^\circ \uparrow$
1962.285	A	20	0.38	6.67	$1\frac{1}{2}-2\frac{1}{2}$		1484.035	A	300	0.19	8.51	$3\frac{1}{2}-4\frac{1}{2}$	(21)
*1845.974	A	30	0.19	6.88	$3\frac{1}{2}-2\frac{1}{2}$	$a^4F - z \ ^4P^\circ$	1491.224	A	5	0.31	8.59	$2\frac{1}{2}-3\frac{1}{2}$	
*1845.974	A	30	0.31	7.00	$2\frac{1}{2}-1\frac{1}{2}$	(6)	*1516.256	A	30	0.38	8.52	$1\frac{1}{2}-2\frac{1}{2}$	
1579.578	A	10	0.00	7.82	$4\frac{1}{2}-5\frac{1}{2}$	$a^4F - z \ ^4H^\circ$	1451.224	A	100	0.00	8.51	$4\frac{1}{2}-4\frac{1}{2}$	
1629.092	A	15	0.19	7.77	$3\frac{1}{2}-4\frac{1}{2}$	(7)	1469.941	A	100	0.19	8.59	$3\frac{1}{2}-3\frac{1}{2}$	
1589.645	A	15	0.00	7.77	$4\frac{1}{2}-4\frac{1}{2}$		*1516.256	A	30	0.31	8.45	$2\frac{1}{2}-1\frac{1}{2}$	$a^4F - z \ ^2P^\circ$
1599.309	A	15	0.00	7.72	$4\frac{1}{2}-3\frac{1}{2}$		1530.415	A	10	0.38	8.45	$1\frac{1}{2}-1\frac{1}{2}$	(22)
1574.337	A	500d?	0.00	7.84	$4\frac{1}{2}-5\frac{1}{2}$	$a^4F - z \ ^4G^\circ$	1468.660	A	10	0.19	8.59	$3\frac{1}{2}-4\frac{1}{2}$	$a^4F - y \ ^4H^\circ$
1604.405	A	100	0.19	7.88	$3\frac{1}{2}-4\frac{1}{2}$	(8)	1467.723	A	30	0.19	8.60	$3\frac{1}{2}-3\frac{1}{2}$	(23)
1627.397	A	100	0.31	7.89	$2\frac{1}{2}-3\frac{1}{2}$		1468.909	A	200	0.31	8.71	$2\frac{1}{2}-2\frac{1}{2}$	$a^4F - y \ ^2D^\circ \uparrow$
1641.460	A	100	0.38	7.90	$1\frac{1}{2}-2\frac{1}{2}$		1477.632	A	100	0.38	8.74	$1\frac{1}{2}-1\frac{1}{2}$	(24)
1566.128	A	100	0.00	7.88	$4\frac{1}{2}-4\frac{1}{2}$		1440.514	A	30	0.38	8.95	$1\frac{1}{2}-1\frac{1}{2}$	$a^4F - w \ ^4F^\circ \uparrow$
1602.095	A	100	0.19	7.89	$3\frac{1}{2}-3\frac{1}{2}$		*1246.887	A	50	0.19	10.09	$3\frac{1}{2}-2\frac{1}{2}$	$a^4F - w \ ^4P^\circ$
1625.178	A	100	0.31	7.90	$2\frac{1}{2}-2\frac{1}{2}$								(26)
*1563.928	A	15	0.00	7.89	$4\frac{1}{2}-3\frac{1}{2}$								
*1599.937	A	10	0.19	7.90	$3\frac{1}{2}-2\frac{1}{2}$								
1605.787	A	30	0.19	7.88	$3\frac{1}{2}-2\frac{1}{2}$	$a^4F - y \ ^4P^\circ \uparrow$							
1647.615	A	20	0.38	7.88	$1\frac{1}{2}-2\frac{1}{2}$	(9)							
1590.774	A	30	0.19	7.95	$3\frac{1}{2}-4\frac{1}{2}$	$a^4F - z \ ^4I^\circ \uparrow$							
						(10)	Air						
1530.762	A	5	0.00	8.06	$4\frac{1}{2}-4\frac{1}{2}$	$a^4F - y \ ^4F^\circ \uparrow$	2346.38	A	150	1.02	6.28	$2\frac{1}{2}-3\frac{1}{2}$	$a^4P - z \ ^6F^\circ$
1581.636	A	10	0.19	7.99	$3\frac{1}{2}-3\frac{1}{2}$	(11)	*2341.06	A	100	1.05	6.32	$1\frac{1}{2}-2\frac{1}{2}$	(27)
1613.685	A	3	0.31	7.96	$2\frac{1}{2}-2\frac{1}{2}$		2383.42	A	90	1.16	6.34	$0\frac{1}{2}-1\frac{1}{2}$	
1617.663	A	15	0.38	8.02	$1\frac{1}{2}-1\frac{1}{2}$		*2329.02	A	150	1.02	6.32	$2\frac{1}{2}-2\frac{1}{2}$	
1544.414	A	30	0.00	7.99	$4\frac{1}{2}-3\frac{1}{2}$		2333.57	A	150	1.05	6.34	$1\frac{1}{2}-1\frac{1}{2}$	
1567.308	A	50	0.19	8.06	$3\frac{1}{2}-4\frac{1}{2}$		2379.84	A	100	1.16	6.34	$0\frac{1}{2}-0\frac{1}{2}$	
1570.104	A	15	0.19	8.05	$3\frac{1}{2}-3\frac{1}{2}$	$a^4F - z \ ^2G^\circ \uparrow$	*2321.66	A	80	1.02	6.34	$2\frac{1}{2}-1\frac{1}{2}$	
1533.435	A	10	0.00	8.05	$4\frac{1}{2}-3\frac{1}{2}$	(12)	2330.14	A	30	1.05	6.34	$1\frac{1}{2}-0\frac{1}{2}$	
1594.398	A	30	0.31	8.05	$2\frac{1}{2}-3\frac{1}{2}$		2309.14	A	70	1.02	6.36	$2\frac{1}{2}-3\frac{1}{2}$	$a^4P - z \ ^6P^\circ$
1509.432	A	40	0.00	8.18	$4\frac{1}{2}-5\frac{1}{2}$	$a^4F - z \ ^2I^\circ$	2254.45	A	100	1.05	6.52	$1\frac{1}{2}-2\frac{1}{2}$	(28)
						(13)	2256.07	A	100	1.16	6.63	$0\frac{1}{2}-1\frac{1}{2}$	
1524.937	A	15	0.19	8.28	$3\frac{1}{2}-2\frac{1}{2}$	$a^4F - z \ ^2F^\circ \uparrow$	2243.27	A	80	1.02	6.52	$2\frac{1}{2}-2\frac{1}{2}$	
1562.607	A	30	0.38	8.28	$1\frac{1}{2}-2\frac{1}{2}$	(14)	2211.325	A	10	1.05	6.63	$1\frac{1}{2}-1\frac{1}{2}$	
							2174.713	A	100	1.02	6.69	$2\frac{1}{2}-3\frac{1}{2}$	$a^4P - z \ ^4F^\circ \uparrow$
							2158.373	A	20	1.05	6.76	$1\frac{1}{2}-2\frac{1}{2}$	(29)

Ru II—Continued

I A	Ref	Int	E P		J	Multiplet No.
			Low	High		
Air						
2218.552	A	500	1.02	6.58	$2\frac{1}{2}-3\frac{1}{2}$	$a^4P - z^4D^\circ$
2192.889	A	200	1.05	6.67	$1\frac{1}{2}-2\frac{1}{2}$	(30)
2207.328	A	100	1.16	6.75	$0\frac{1}{2}-1\frac{1}{2}$	
2164.480	A	20	1.05	6.75	$1\frac{1}{2}-1\frac{1}{2}$	
2191.923	A	20	1.16	6.79	$0\frac{1}{2}-0\frac{1}{2}$	
2107.322	A	500	1.02	6.88	$2\frac{1}{2}-2\frac{1}{2}$	$a^4P - z^4P^\circ$
2074.581	A	200	1.05	7.00	$1\frac{1}{2}-1\frac{1}{2}$	(31)
2087.463	A	20	1.16	7.07	$0\frac{1}{2}-0\frac{1}{2}$	
2065.110	A	100	1.02	7.00	$2\frac{1}{2}-1\frac{1}{2}$	
2049.111	A	200	1.05	7.07	$1\frac{1}{2}-0\frac{1}{2}$	
2117.190	A	100	1.05	6.88	$1\frac{1}{2}-2\frac{1}{2}$	
2113.895	A	200	1.16	7.00	$0\frac{1}{2}-1\frac{1}{2}$	
Vac						
1845.368	A	100	1.02	7.71	$2\frac{1}{2}-1\frac{1}{2}$	$a^4P - z^4S^\circ$
1884.154	A	10?	1.16	7.71	$0\frac{1}{2}-1\frac{1}{2}?$	(32)
1800.470	A	15	1.02	7.88	$2\frac{1}{2}-2\frac{1}{2}$	$a^4P - y^4P^\circ \dagger$
1753.441	A	30	1.05	8.09	$1\frac{1}{2}-1\frac{1}{2}$	(33)
1731.415	A	50	1.02	8.15	$2\frac{1}{2}-3\frac{1}{2}$	$a^4P - z^2F^\circ \dagger$
1699.442	A	20	1.02	8.28	$2\frac{1}{2}-2\frac{1}{2}?$	(34)
1590.882	A	30	1.02	8.78	$2\frac{1}{2}-2\frac{1}{2}$	$a^4P - x^4P^\circ$
1577.573	A	10	1.05	8.87	$1\frac{1}{2}-1\frac{1}{2}$	(35)
1572.089	A	20	1.02	8.87	$2\frac{1}{2}-1\frac{1}{2}$	
1545.152	A	15	1.05	9.04	$1\frac{1}{2}-0\frac{1}{2}$	
1596.482	A	10	1.05	8.78	$1\frac{1}{2}-2\frac{1}{2}$	
*1600.183	A	30	1.16	8.87	$0\frac{1}{2}-1\frac{1}{2}$	
1584.256	A	30	1.05	8.84	$1\frac{1}{2}-2\frac{1}{2}$	$a^4P - y^2F^\circ \dagger$
1578.728	A	30	1.02	8.84	$2\frac{1}{2}-2\frac{1}{2}$	(36)
*1507.429	A	100d?	1.02	9.21	$2\frac{1}{2}-3\frac{1}{2}$	$a^4P - w^4D^\circ \dagger$
1543.042	A	10	1.05	9.05	$1\frac{1}{2}-2\frac{1}{2}$	(37)
*1563.928	A	15	1.16	9.05	$0\frac{1}{2}-1\frac{1}{2}$	
1537.806	A	20	1.02	9.05	$2\frac{1}{2}-2\frac{1}{2}$	
1542.293	A	15	1.05	9.05	$1\frac{1}{2}-1\frac{1}{2}$	
1488.618	A	200	1.02	9.31	$2\frac{1}{2}-3\frac{1}{2}?$	$a^4P - w^2G^\circ$
						(38)
1442.147	A	30	1.05	9.61	$1\frac{1}{2}-2\frac{1}{2}$	$a^4P - w^2D^\circ$
						(39)
Air						
2678.759	A	800	1.13	5.74	$4\frac{1}{2}-4\frac{1}{2}$	$a^6D - z^6D^\circ$
2734.345	A	500	1.25	5.77	$3\frac{1}{2}-3\frac{1}{2}$	(40)
*2743.934§	A	60	1.34	5.84	$2\frac{1}{2}-2\frac{1}{2}$	
2746.068	A	20	1.40	5.89	$1\frac{1}{2}-1\frac{1}{2}$	
*2747.963§	A	50	1.43	5.92	$0\frac{1}{2}-0\frac{1}{2}$	
2661.610	A	300	1.13	5.77	$4\frac{1}{2}-3\frac{1}{2}$	
2692.120	A	400	1.25	5.84	$3\frac{1}{2}-2\frac{1}{2}$	
2712.409	A	300	1.34	5.89	$2\frac{1}{2}-1\frac{1}{2}$	
2725.465	A	300	1.40	5.92	$1\frac{1}{2}-0\frac{1}{2}$	
2752.447	A	30	1.25	5.74	$3\frac{1}{2}-4\frac{1}{2}$	
2787.823	A	200	1.34	5.77	$2\frac{1}{2}-3\frac{1}{2}$	
2778.388	A	150	1.40	5.84	$1\frac{1}{2}-2\frac{1}{2}$	
2768.926	A	250	1.43	5.89	$0\frac{1}{2}-1\frac{1}{2}$	
2402.72†	A	800	1.13	6.27	$4\frac{1}{2}-5\frac{1}{2}$	$a^6D - z^6F^\circ$
2456.57	A	500	1.25	6.28	$3\frac{1}{2}-4\frac{1}{2}$	(41)
2498.58	A	200	1.34	6.28	$2\frac{1}{2}-3\frac{1}{2}$	
2507.00	A	300	1.40	6.32	$1\frac{1}{2}-2\frac{1}{2}$	
2517.32	A	200	1.43	6.34	$0\frac{1}{2}-1\frac{1}{2}$	
2397.69	A	100	1.13	6.28	$4\frac{1}{2}-4\frac{1}{2}$	
2455.53	A	600	1.25	6.28	$3\frac{1}{2}-3\frac{1}{2}$	
2478.93	A	500	1.34	6.32	$2\frac{1}{2}-2\frac{1}{2}$	
2498.41	A	200	1.40	6.34	$1\frac{1}{2}-1\frac{1}{2}$	
2513.32	A	150	1.43	6.34	$0\frac{1}{2}-0\frac{1}{2}$	
2396.71	A	600	1.13	6.28	$4\frac{1}{2}-3\frac{1}{2}$	
2436.55	A	5	1.25	6.32	$3\frac{1}{2}-2\frac{1}{2}$	
2470.51	A	60	1.34	6.34	$2\frac{1}{2}-1\frac{1}{2}$	
2494.48	A	40	1.40	6.34	$1\frac{1}{2}-0\frac{1}{2}$	

Ru II—Continued

I A	Ref	Int	E P		J	Multiplet No.
			Low	High		
Air						
2357.92	A	600	1.13	6.36	$4\frac{1}{2}-3\frac{1}{2}$	$a^6D - z^6P^\circ$
2342.85	A	300	1.25	6.52	$3\frac{1}{2}-2\frac{1}{2}$	(42)
2333.89	A	200	1.34	6.63	$2\frac{1}{2}-1\frac{1}{2}$	
2414.82	A	150	1.25	6.36	$3\frac{1}{2}-3\frac{1}{2}$	
2381.99	A	400	1.34	6.52	$2\frac{1}{2}-2\frac{1}{2}$	
2358.79	A	400	1.40	6.63	$1\frac{1}{2}-1\frac{1}{2}$	
2456.44	A	500	1.34	6.36	$2\frac{1}{2}-3\frac{1}{2}$	
2407.92	A	300	1.40	6.52	$1\frac{1}{2}-2\frac{1}{2}$	
2375.63	A	400	1.43	6.63	$0\frac{1}{2}-1\frac{1}{2}$	
2281.72	A	300	1.13	6.54	$4\frac{1}{2}-4\frac{1}{2}$	$a^6D - z^4F^\circ \dagger$
2268.14	A	400	1.25	6.69	$3\frac{1}{2}-3\frac{1}{2}$	(43)
2275.00	A	150	1.34	6.76	$2\frac{1}{2}-2\frac{1}{2}$	
2276.14	A	100	1.40	6.82	$1\frac{1}{2}-1\frac{1}{2}$	
2334.96	A	300	1.25	6.54	$3\frac{1}{2}-4\frac{1}{2}$	
2304.82	A	200	1.34	6.69	$2\frac{1}{2}-3\frac{1}{2}$	
2298.63	A	90	1.40	6.76	$1\frac{1}{2}-2\frac{1}{2}$	
2291.82	A	50	1.43	6.82	$0\frac{1}{2}-1\frac{1}{2}$	
2263.51	A	300	1.13	6.58	$4\frac{1}{2}-3\frac{1}{2}$	$a^6D - z^4D^\circ$
2276.43	A	100	1.25	6.67	$3\frac{1}{2}-2\frac{1}{2}$	(44)
2288.80	A	15	1.40	6.79	$1\frac{1}{2}-0\frac{1}{2}$	
*2315.90	A	50	1.25	6.58	$3\frac{1}{2}-3\frac{1}{2}$	
2313.37	A	150	1.34	6.67	$2\frac{1}{2}-2\frac{1}{2}$	
*2305.61	A	200	1.40	6.75	$1\frac{1}{2}-1\frac{1}{2}$	
*2304.63§	A	100	1.43	6.79	$0\frac{1}{2}-0\frac{1}{2}$	
2337.84	A	100	1.40	6.67	$1\frac{1}{2}-2\frac{1}{2}$	
*2321.66	A	80	1.43	6.75	$0\frac{1}{2}-1\frac{1}{2}$	
2194.970	A	20	1.25	6.88	$3\frac{1}{2}-2\frac{1}{2}$	$a^6D - z^4P^\circ$
2182.081	A	10	1.34	7.00	$2\frac{1}{2}-1\frac{1}{2}$	(45)
2229.284	A	50	1.34	6.88	$2\frac{1}{2}-2\frac{1}{2}$	
2203.837	A	10	1.40	7.00	$1\frac{1}{2}-1\frac{1}{2}$	
Vac						
1560.998	A	50	1.13	9.04	$4\frac{1}{2}-3\frac{1}{2}$	$a^6D - y^6P^\circ$
1593.403	A	40	1.25	9.00	$3\frac{1}{2}-2\frac{1}{2}$	(46)
1615.267	A	20	1.34	8.98	$2\frac{1}{2}-1\frac{1}{2}$	
1585.740	A	30	1.25	9.04	$3\frac{1}{2}-3\frac{1}{2}$	
1611.415	A	50	1.34	9.00	$2\frac{1}{2}-2\frac{1}{2}$	
1627.138	A	50	1.40	8.98	$1\frac{1}{2}-1\frac{1}{2}$	
1603.572	A	10	1.34	9.04	$2\frac{1}{2}-3\frac{1}{2}$	
1623.231	A	20	1.40	9.00	$1\frac{1}{2}-2\frac{1}{2}$	
1635.129	A	30	1.43	8.98	$0\frac{1}{2}-1\frac{1}{2}$	
1234.347	A	100	1.13	11.13	$4\frac{1}{2}-3\frac{1}{2}$	$a^6D - x^6P^\circ$
1239.467	A	100	1.25	11.21	$3\frac{1}{2}-2\frac{1}{2}$	(47)
1239.879	A	50	1.34	11.30	$2\frac{1}{2}-1\frac{1}{2}$	
1249.774	A	15	1.25	11.13	$3\frac{1}{2}-3\frac{1}{2}$	
1250.340	A	20	1.34	11.21	$2\frac{1}{2}-2\frac{1}{2}$	
*1246.887	A	50	1.40	11.30	$1\frac{1}{2}-1\frac{1}{2}$	
1260.817	A	20	1.34	11.13	$2\frac{1}{2}-3\frac{1}{2}$	
1257.443	A	40	1.40	11.21	$1\frac{1}{2}-2\frac{1}{2}$	
1251.582	A	15	1.43	11.30	$0\frac{1}{2}-1\frac{1}{2}$	
1990.720	A	200	1.52	7.72	$3\frac{1}{2}-3\frac{1}{2}$	$a^2G - z^4H^\circ \dagger$
						(48)
1836.013	A	50	1.34	8.06	$4\frac{1}{2}-4\frac{1}{2}$	$a^2G - y^4F^\circ$
*1906.378	A	5	1.52	7.99	$3\frac{1}{2}-3\frac{1}{2}$	(49)
*1885.559	A	50h	1.52	8.06	$3\frac{1}{2}-4\frac{1}{2}$	
1776.061	A	50	1.34	8.29	$4\frac{1}{2}-4\frac{1}{2}$	$a^2G - y^4G^\circ \dagger$
1806.599	A	15	1.52	8.35	$3\frac{1}{2}-3\frac{1}{2}$	(50)
1761.030	A	20	1.34	8.35	$4\frac{1}{2}-3\frac{1}{2}$	
1765.525	A	20	1.34	8.33	$4\frac{1}{2}-5\frac{1}{2}$	$a^2G - z^2H^\circ$
1791.253	A	20	1.52	8.41	$3\frac{1}{2}-4\frac{1}{2}$	(51)
*1746.446	A	30	1.34	8.41	$4\frac{1}{2}-4\frac{1}{2}$	
1740.114	A	15	1.34	8.44	$4\frac{1}{2}-5\frac{1}{2}$	$a^2G - x^4G^\circ \dagger$
*1746.446	A	30	1.52	8.59	$3\frac{1}{2}-3\frac{1}{2}$	(52)

Ru II—Continued

Ru II—Continued

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Vac 1701.080	A	30	1.34	8.60	$4\frac{1}{2}-5\frac{1}{2}$	$a^2G - y^4H^\circ \uparrow$ (53)	Vac 1635.948 1672.225 1632.321	A A A	100 30 30	1.81 1.99 1.81	9.36 9.37 9.37	$5\frac{1}{2}-6\frac{1}{2}$ $4\frac{1}{2}-5\frac{1}{2}$ $5\frac{1}{2}-5\frac{1}{2}$	$a^2H - y^2I^\circ$ (73)
1657.217	A	30	1.34	8.79	$4\frac{1}{2}-5\frac{1}{2}$	$a^2G - y^2H^\circ \uparrow$	1570.371	A	30	1.99	9.85	$4\frac{1}{2}-3\frac{1}{2}$	$a^2H - v^2F^\circ$ (74)
1637.591	A	40	1.34	8.88	$4\frac{1}{2}-4\frac{1}{2}$								
1635.333	A	50	1.34	8.89	$4\frac{1}{2}-3\frac{1}{2}$	$a^2G - y^2F^\circ$							
1686.161	A	15e	1.52	8.84	$3\frac{1}{2}-2\frac{1}{2}$	(55)							
1585.040	A	50	1.34	9.13	$4\frac{1}{2}-5\frac{1}{2}$	$a^2G - x^2H^\circ \uparrow$	Air 2976.578	A	200	2.39	6.54	$3\frac{1}{2}-4\frac{1}{2}$	$a^4D - z^4F^\circ \uparrow$ (75)
1637.446	A	30	1.52	9.06	$3\frac{1}{2}-4\frac{1}{2}$	(56)	2965.554	A	200	2.53	6.69	$2\frac{1}{2}-3\frac{1}{2}$	
1582.652	A	10	1.34	9.14	$4\frac{1}{2}-4\frac{1}{2}$	$a^2G - x^2G^\circ$	2979.946	A	70	2.62	6.76	$1\frac{1}{2}-2\frac{1}{2}$	
1625.565	A	50	1.52	9.11	$3\frac{1}{2}-3\frac{1}{2}$	(57)	2977.219	A	30	2.67	6.82	$0\frac{1}{2}-1\frac{1}{2}$	
1619.365	A	20	1.52	9.14	$3\frac{1}{2}-4\frac{1}{2}$		2916.370	A	50	2.53	6.76	$2\frac{1}{2}-2\frac{1}{2}$	
1550.740	A	30	1.34	9.30	$4\frac{1}{2}-4\frac{1}{2}$	$a^2G - w^2G^\circ$	2942.244	A	50	2.62	6.82	$1\frac{1}{2}-1\frac{1}{2}$	
1583.819	A	200	1.52	9.31	$3\frac{1}{2}-3\frac{1}{2}$	(58)	2945.661	A	500	2.39	6.58	$3\frac{1}{2}-3\frac{1}{2}$	$a^4D - z^4D^\circ$ (76)
1548.679	A	10	1.34	9.31	$4\frac{1}{2}-3\frac{1}{2}$		2979.713	A	60	2.53	6.67	$2\frac{1}{2}-2\frac{1}{2}$	
1585.965	A	15	1.52	9.30	$3\frac{1}{2}-4\frac{1}{2}$		2991.621	A	70	2.62	6.75	$1\frac{1}{2}-1\frac{1}{2}$	
1545.961	A	15	1.52	9.50	$3\frac{1}{2}-3\frac{1}{2}$	$a^2G - w^2F^\circ$	2998.886	A	75	2.67	6.79	$0\frac{1}{2}-0\frac{1}{2}$	
1512.483	A	40	1.34	9.50	$4\frac{1}{2}-3\frac{1}{2}$	(59)	2882.112	A	200	2.39	6.67	$3\frac{1}{2}-2\frac{1}{2}$	
							2927.535	A	200	2.53	6.75	$2\frac{1}{2}-1\frac{1}{2}$	
							2963.398	A	60	2.62	6.79	$1\frac{1}{2}-0\frac{1}{2}$	
							3047.702	A	25	2.53	6.58	$2\frac{1}{2}-3\frac{1}{2}$	
							3046.132	A	10	2.62	6.67	$1\frac{1}{2}-2\frac{1}{2}$	
							3027.780	A	30	2.67	6.75	$0\frac{1}{2}-1\frac{1}{2}$	
Air 2339.10	A	20	1.60	6.88	$1\frac{1}{2}-2\frac{1}{2}$	$a^2P - z^4P^\circ \uparrow$	2752.763	A	50	2.39	6.88	$3\frac{1}{2}-2\frac{1}{2}$	$a^4D - z^4P^\circ$ (77)
*2354.24	A	40	1.83	7.07	$0\frac{1}{2}-0\frac{1}{2}$	(60)	2765.429	A	100	2.53	7.00	$2\frac{1}{2}-1\frac{1}{2}$	
2256.25	A	20	1.60	7.07	$1\frac{1}{2}-0\frac{1}{2}$		2775.631	A	30	2.62	7.07	$1\frac{1}{2}-0\frac{1}{2}$	
Vac 1912.484	A	30	1.60	8.05	$1\frac{1}{2}-2\frac{1}{2}$	$a^2P - z^2D^\circ$ (61)	2841.680	A	100	2.53	6.88	$2\frac{1}{2}-2\frac{1}{2}$	
							2822.542	A	150	2.62	7.00	$1\frac{1}{2}-1\frac{1}{2}$	
							2806.77	A	100	2.67	7.07	$0\frac{1}{2}-0\frac{1}{2}$	
							2902.026	A	75	2.62	6.88	$1\frac{1}{2}-2\frac{1}{2}$	
							2854.722	A	40	2.67	7.00	$0\frac{1}{2}-1\frac{1}{2}$	
							2260.03	A	60	2.53	7.99	$2\frac{1}{2}-3\frac{1}{2}$	$a^4D - y^4F^\circ \uparrow$ (78)
1741.262	A	20	1.80	8.89	$2\frac{1}{2}-3\frac{1}{2}$	$a^2D - y^2F^\circ$	2128.836	A	10	2.39	8.19	$3\frac{1}{2}-3\frac{1}{2}$	$a^4D - y^4D^\circ \uparrow$ (79)
1832.144	A	20	2.10	8.84	$1\frac{1}{2}-2\frac{1}{2}$	(62)	2181.622	A	30	2.53	8.19	$2\frac{1}{2}-3\frac{1}{2}$	
1651.898	A	30	1.80	9.27	$2\frac{1}{2}-2\frac{1}{2}$	$a^2D - x^2D^\circ$	2103.377	A	10	2.62	8.49	$1\frac{1}{2}-2\frac{1}{2}$	
1721.171	A	10	2.10	9.27	$1\frac{1}{2}-2\frac{1}{2}$	(63)	2166.828	A	20	2.53	8.23	$2\frac{1}{2}-2\frac{1}{2}$	$a^4D - x^4D^\circ \uparrow$ (80)
1594.603	A	30	1.80	9.54	$2\frac{1}{2}-1\frac{1}{2}$	$a^2D - y^2P^\circ$ (64)	2180.063	A	15	2.62	8.28	$1\frac{1}{2}-1\frac{1}{2}$	
1581.328	A	15	1.80	9.61	$2\frac{1}{2}-2\frac{1}{2}$	$a^2D - w^2D^\circ \uparrow$	2201.736	A	10	2.62	8.23	$1\frac{1}{2}-2\frac{1}{2}$	
1623.390	A	20	2.10	9.70	$1\frac{1}{2}-1\frac{1}{2}$	(65)	2199.165	A	20	2.67	8.28	$0\frac{1}{2}-1\frac{1}{2}$	
Air 2043.301	A	20	1.81	7.85	$5\frac{1}{2}-6\frac{1}{2}$	$a^2H - z^4H^\circ \uparrow$	Vac 1604.029	A	30	2.39	10.09	$3\frac{1}{2}-2\frac{1}{2}$	$a^4D - w^4P^\circ \uparrow$ (81)
2154.427	A	30	1.99	7.72	$4\frac{1}{2}-3\frac{1}{2}$	(66)	1620.102	A	20	2.53	10.15	$2\frac{1}{2}-1\frac{1}{2}$	
Vac 1940.422	A	30	1.81	8.17	$5\frac{1}{2}-6\frac{1}{2}$	$a^2H - z^4I^\circ \uparrow$ (67)	1628.541	A	10	2.62	10.20	$1\frac{1}{2}-0\frac{1}{2}$	
1965.293	A	200	1.81	8.09	$5\frac{1}{2}-6\frac{1}{2}$	$a^2H - z^2I^\circ$	1633.802	A	10	2.53	10.09	$2\frac{1}{2}-2\frac{1}{2}$	
1995.048	A	100	1.99	8.18	$4\frac{1}{2}-5\frac{1}{2}$	(68)	1639.530	A	15	2.62	10.15	$1\frac{1}{2}-1\frac{1}{2}$	
1863.404	A	500	1.81	8.44	$5\frac{1}{2}-5\frac{1}{2}$	$a^2H - x^4G^\circ \uparrow$ (69)	1639.209	A	15	2.67	10.20	$0\frac{1}{2}-0\frac{1}{2}$	
1686.691	A	100	1.81	9.13	$5\frac{1}{2}-5\frac{1}{2}$	$a^2H - x^2H^\circ$	Air 2322.83	A	60	2.75	8.06	$3\frac{1}{2}-4\frac{1}{2}$	$a^2F - y^4F^\circ \uparrow$ (82)
1703.562	A	50	1.81	9.06	$5\frac{1}{2}-4\frac{1}{2}$	(70)	2181.254	A	30	2.75	8.41	$3\frac{1}{2}-4\frac{1}{2}$	$a^2F - z^2H^\circ$ (83)
1683.985	A	50	1.81	9.14	$5\frac{1}{2}-4\frac{1}{2}$	$a^2H - x^2G^\circ$	2079.967	A	50	2.66	8.60	$2\frac{1}{2}-1\frac{1}{2}$	$a^2F - x^4F^\circ \uparrow$ (84)
1733.537	A	20	1.99	9.11	$4\frac{1}{2}-3\frac{1}{2}$	(71)	2131.898	A	100	2.75	8.54	$3\frac{1}{2}-4\frac{1}{2}$	$a^2F - y^2G^\circ \uparrow$ (85)
1639.371	A	20	1.81	9.34	$5\frac{1}{2}-5\frac{1}{2}$	$a^2H - w^2H^\circ$	2082.916	A	30	2.66	8.59	$2\frac{1}{2}-3\frac{1}{2}$	$a^2F - x^4G^\circ \uparrow$ (86)
1659.364	A	100	1.99	9.43	$4\frac{1}{2}-4\frac{1}{2}$	(72)	2078.455	A	100	2.66	8.60	$2\frac{1}{2}-3\frac{1}{2}$	$a^2F - y^4H^\circ \uparrow$ (87)
1679.620	A	30	1.99	9.34	$4\frac{1}{2}-5\frac{1}{2}$								

Ru II—Continued

I A	Ref	Int	E P		J	Multiplet No.
			Low	High		
Air						
2070.515	A	30	2.75	8.71	$3\frac{1}{2}-2\frac{1}{2}$	$a^2F - y^2D^\circ$
2030.979	A	10	2.66	8.74	$2\frac{1}{2}-1\frac{1}{2}$	(88)
2039.626	A	10	2.66	8.71	$2\frac{1}{2}-2\frac{1}{2}$	
Vac						
*1932.118	A	50	2.75	9.14	$3\frac{1}{2}-4\frac{1}{2}$	$a^2F - x^2G^\circ \dagger$
1913.797	A	20	2.66	9.11	$2\frac{1}{2}-3\frac{1}{2}$	(89)
1892.926	A	20	2.75	9.27	$3\frac{1}{2}-2\frac{1}{2}$	$a^2F - x^2D^\circ$
*1885.559	A	50h	2.66	9.21	$2\frac{1}{2}-1\frac{1}{2}$	(90)
1459.028	A	40	2.75	11.21	$3\frac{1}{2}-2\frac{1}{2}$	$a^2F - x^6P^\circ?$
						(91)
Air						
2656.235	A	300	3.20	7.85	$6\frac{1}{2}-6\frac{1}{2}$	$a^4H - z^4H^\circ$
2387.494	A	100	3.22	7.82	$5\frac{1}{2}-5\frac{1}{2}$	(92)
2717.447	A	80	3.22	7.77	$4\frac{1}{2}-4\frac{1}{2}$	
2772.459	A	100	3.27	7.72	$3\frac{1}{2}-3\frac{1}{2}$	
*2676.183	A	100	3.20	7.82	$6\frac{1}{2}-5\frac{1}{2}$	
2716.78	A	1	3.22	7.77	$5\frac{1}{2}-4\frac{1}{2}$	
2745.827	A	50	3.22	7.72	$4\frac{1}{2}-3\frac{1}{2}$	
2667.390	A	100	3.22	7.85	$5\frac{1}{2}-6\frac{1}{2}$	
2688.147	A	80	3.22	7.82	$4\frac{1}{2}-5\frac{1}{2}$	
2743.513	A	25	3.27	7.77	$3\frac{1}{2}-4\frac{1}{2}$	
2661.169	A	200	3.20	7.84	$6\frac{1}{2}-5\frac{1}{2}$	$a^4H - z^4G^\circ$
*2648.78§	A	100	3.22	7.88	$5\frac{1}{2}-4\frac{1}{2}$	(93)
2643.14	A	20	3.22	7.89	$4\frac{1}{2}-3\frac{1}{2}$	
2661.82	A	20	3.27	7.90	$3\frac{1}{2}-2\frac{1}{2}$	
2672.354	A	25	3.22	7.84	$5\frac{1}{2}-5\frac{1}{2}$	
2667.79	A	10	3.27	7.89	$3\frac{1}{2}-3\frac{1}{2}$	
2673.004	A	30	3.22	7.84	$4\frac{1}{2}-5\frac{1}{2}$	
2674.219	A	10	3.27	7.88	$3\frac{1}{2}-4\frac{1}{2}$	
2543.272	A	300	3.20	8.06	$6\frac{1}{2}-7\frac{1}{2}$	$a^4H - z^4I^\circ \dagger$
2493.68	A	300	3.22	8.17	$5\frac{1}{2}-6\frac{1}{2}$	(94)
2540.30	A	100	3.22	8.08	$4\frac{1}{2}-5\frac{1}{2}$	
2636.54	A	100	3.27	7.95	$3\frac{1}{2}-4\frac{1}{2}$	
2483.96	A	50	3.20	8.17	$6\frac{1}{2}-6\frac{1}{2}$	
*2539.72	A	100	3.22	8.08	$5\frac{1}{2}-5\frac{1}{2}$	
2529.61	A	20	3.20	8.08	$6\frac{1}{2}-5\frac{1}{2}$	
2549.121	A	50	3.22	8.06	$5\frac{1}{2}-4\frac{1}{2}$	$a^4H - y^4F^\circ$
2587.87	A	75	3.22	7.99	$4\frac{1}{2}-3\frac{1}{2}$	(95)
2631.09	A	20	3.27	7.96	$3\frac{1}{2}-2\frac{1}{2}$	
2611.50	A	40	3.27	7.99	$3\frac{1}{2}-3\frac{1}{2}$	
2572.67	A	10	3.27	8.06	$3\frac{1}{2}-4\frac{1}{2}$	
2520.82	A	40	3.22	8.12	$4\frac{1}{2}-4\frac{1}{2}$	$a^4H - z^2G^\circ \dagger$
2543.216	A	100	3.27	8.12	$3\frac{1}{2}-4\frac{1}{2}$	(96)
2524.85	A	100	3.20	8.09	$6\frac{1}{2}-6\frac{1}{2}$	$a^4H - z^2I^\circ \dagger$
2480.81	A	30	3.20	8.18	$6\frac{1}{2}-5\frac{1}{2}$	(97)
2534.92	A	80	3.22	8.09	$5\frac{1}{2}-6\frac{1}{2}$	
*2491.10	A	40	3.22	8.18	$4\frac{1}{2}-5\frac{1}{2}$	
*2373.96	A	20	3.22	8.42	$4\frac{1}{2}-3\frac{1}{2}$	$a^4H - x^4D^\circ \dagger$
2393.84	A	200	3.27	8.42	$3\frac{1}{2}-3\frac{1}{2}$	(98)
2434.98	A	80	3.22	8.29	$5\frac{1}{2}-4\frac{1}{2}$	$a^4H - y^4G^\circ \dagger$
2407.31	A	20	3.22	8.35	$4\frac{1}{2}-3\frac{1}{2}$	(99)
2410.15	A	150	3.27	8.39	$3\frac{1}{2}-2\frac{1}{2}$	
2435.51	A	200	3.22	8.29	$4\frac{1}{2}-4\frac{1}{2}$	
2427.75	A	60	3.27	8.35	$3\frac{1}{2}-3\frac{1}{2}$	
2406.06	A	20	3.20	8.33	$6\frac{1}{2}-5\frac{1}{2}$	$a^4H - z^2H^\circ \dagger$
2379.60	A	100	3.22	8.41	$5\frac{1}{2}-4\frac{1}{2}$	(100)
2415.20	A	120	3.22	8.33	$5\frac{1}{2}-5\frac{1}{2}$	
2415.72	A	100	3.22	8.33	$4\frac{1}{2}-5\frac{1}{2}$	
2309.52	A	50	3.22	8.57	$4\frac{1}{2}-3\frac{1}{2}$	$a^4H - x^4F^\circ \dagger$
2328.33	A	40	3.27	8.57	$3\frac{1}{2}-3\frac{1}{2}$	(101)

Ru II—Continued

I A	Ref	Int	E P		J	Multiplet No.
			Low	High		
Air						
2371.91	A	100	3.22	8.43	$4\frac{1}{2}-3\frac{1}{2}$	$a^4H - y^2G^\circ$
2391.77	A	60	3.27	8.43	$3\frac{1}{2}-3\frac{1}{2}$	(102)
2340.51	A	30	3.27	8.54	$3\frac{1}{2}-4\frac{1}{2}$	
2359.10	A	150	3.20	8.44	$6\frac{1}{2}-5\frac{1}{2}$	$a^4H - x^4G^\circ \dagger$
2335.88	A	60	3.22	8.51	$5\frac{1}{2}-4\frac{1}{2}$	(103)
2336.38	A	25	3.22	8.51	$4\frac{1}{2}-4\frac{1}{2}$	
2355.63	A	25	3.27	8.51	$3\frac{1}{2}-4\frac{1}{2}$	
*2305.61	A	200	3.20	8.56	$6\frac{1}{2}-6\frac{1}{2}$	$a^4H - y^4H^\circ \dagger$
*2296.18	A	150	3.22	8.60	$5\frac{1}{2}-5\frac{1}{2}$	(104)
2298.45	A	40	3.22	8.59	$4\frac{1}{2}-4\frac{1}{2}$	
2314.78	A	50	3.27	8.60	$3\frac{1}{2}-3\frac{1}{2}$	
2297.97	A	30	3.22	8.59	$5\frac{1}{2}-4\frac{1}{2}$	
*2296.18	A	150	3.22	8.60	$4\frac{1}{2}-3\frac{1}{2}$	
2314.02	A	50	3.22	8.56	$5\frac{1}{2}-6\frac{1}{2}$	
2135.40?	A	30	3.27	9.05	$3\frac{1}{2}-2\frac{1}{2}$	$a^4H - w^4D^\circ$
						(105)
Vac						
1413.017	A	100	3.20	11.94	$6\frac{1}{2}-5\frac{1}{2}$	$a^4H - v^4G^\circ \dagger$
1420.606	A	100	3.22	11.91	$5\frac{1}{2}-4\frac{1}{2}$	(106)
1428.751	A	100	3.22	11.86	$4\frac{1}{2}-3\frac{1}{2}$	
1444.144	A	50	3.27	11.82	$3\frac{1}{2}-2\frac{1}{2}$	
Air						
2813.311	A	100	3.32	7.71	$2\frac{1}{2}-1\frac{1}{2}$	$b^4P - z^4S^\circ$
						(107)
2710.228	A	100	3.32	7.88	$2\frac{1}{2}-2\frac{1}{2}$	$b^4P - y^4P^\circ \dagger$
2745.158	A	100	3.59	8.09	$1\frac{1}{2}-1\frac{1}{2}$	(108)
2610.09	A	25	3.32	8.05	$2\frac{1}{2}-3\frac{1}{2}$	$b^4P - z^2G^\circ$
						(109)
2607.92	A	20	3.32	8.05	$2\frac{1}{2}-2\frac{1}{2}$	$b^4P - z^2D^\circ$
2765.134	A	20	3.59	8.05	$1\frac{1}{2}-2\frac{1}{2}$	(110)
2535.60	A	100	3.32	8.19	$2\frac{1}{2}-3\frac{1}{2}$	$b^4P - y^4D^\circ \dagger$
2519.20	A	75	3.59	8.49	$1\frac{1}{2}-2\frac{1}{2}$	(111)
2672.212	A	25	3.76	8.38	$0\frac{1}{2}-1\frac{1}{2}$	
2662.880	A	25	3.59	8.23	$1\frac{1}{2}-0\frac{1}{2}$	
*2566.59§	A	20	3.76	8.57	$0\frac{1}{2}-0\frac{1}{2}$	$b^4P - z^2P^\circ$
2633.82	A	20	3.76	8.45	$0\frac{1}{2}-1\frac{1}{2}$	(112)
Vac						
1461.699	A	50	3.32	11.77	$2\frac{1}{2}-3\frac{1}{2}$	$b^4P - v^4D^\circ \dagger$
						(113)
1316.573	A	50	3.32	12.70	$2\frac{1}{2}-3\frac{1}{2}$	$b^4P - v^2G^\circ$
						(114)
Air						
2913.999	A	20	3.47	7.71	$2\frac{1}{2}-1\frac{1}{2}$	$b^4F - z^4S^\circ$
						(115)
2857.780	A	50	3.40	7.72	$4\frac{1}{2}-3\frac{1}{2}$	$b^4F - z^4H^\circ \dagger$
						(116)
2778.975	A	30	3.40	7.84	$4\frac{1}{2}-5\frac{1}{2}$	$b^4F - z^4G^\circ$
*2784.516§	A	40	3.45	7.88	$3\frac{1}{2}-4\frac{1}{2}$	(117)
2792.32	A	100	3.47	7.89	$2\frac{1}{2}-3\frac{1}{2}$	
2813.694	A	60	3.52	7.90	$1\frac{1}{2}-2\frac{1}{2}$	
2753.508	A	20	3.40	7.88	$4\frac{1}{2}-4\frac{1}{2}$	
2777.54	A	50	3.45	7.89	$3\frac{1}{2}-3\frac{1}{2}$	
2785.741	A	75	3.47	7.90	$2\frac{1}{2}-2\frac{1}{2}$	
2746.695	A	25	3.40	7.89	$4\frac{1}{2}-3\frac{1}{2}$	
2771.060	A	50	3.45	7.90	$3\frac{1}{2}-2\frac{1}{2}$	

Ru II—Continued

Ru II—Continued

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Air							Air						
2700.999	A	25	3.52	8.09	$1\frac{1}{2}-1\frac{1}{2}?$	$b^4F -y^4P^\circ\uparrow$	*2257.12	A	80	3.52	8.98	$1\frac{1}{2}-1\frac{1}{2}$	$b^4F -2^\circ$
2831.84	A	50	3.52	7.88	$1\frac{1}{2}-2\frac{1}{2}$	(118)							(135)
*2635.84 §	A	70	3.40	8.08	$4\frac{1}{2}-5\frac{1}{2}$	$b^4F -z^4I^\circ\uparrow$	2205.108	A	20	3.45	9.05	$3\frac{1}{2}-2\frac{1}{2}$	$b^4F -w^4D^\circ\uparrow$
2713.585	A	40	3.40	7.95	$4\frac{1}{2}-4\frac{1}{2}$	(119)	2209.067	A	30	3.52	9.10	$1\frac{1}{2}-0\frac{1}{2}$	(136)
2645.97	A	75	3.40	8.06	$4\frac{1}{2}-4\frac{1}{2}$	$b^4F -y^4F^\circ\uparrow$	Vac						
2716.580	A	10	3.45	7.99	$3\frac{1}{2}-3\frac{1}{2}$	(120)	1475.361	A	50	3.40	11.77	$4\frac{1}{2}-3\frac{1}{2}$	$b^4F -v^4D^\circ\uparrow$
2752.110	A	10	3.47	7.96	$2\frac{1}{2}-2\frac{1}{2}$		1466.039	A	50	3.47	11.89	$2\frac{1}{2}-1\frac{1}{2}$	(137)
2687.071	A	25	3.40	7.99	$4\frac{1}{2}-3\frac{1}{2}$		1445.552	A	30	3.40	11.94	$4\frac{1}{2}-5\frac{1}{2}$	$b^4F -v^4G^\circ\uparrow$
2737.783	A	20	3.45	7.96	$3\frac{1}{2}-2\frac{1}{2}$		1458.721	A	20	3.45	11.91	$3\frac{1}{2}-4\frac{1}{2}$	(138)
2614.86	A	50	3.40	8.12	$4\frac{1}{2}-4\frac{1}{2}$	$b^4F -z^2G^\circ\uparrow$	1471.220	A	10	3.47	11.86	$2\frac{1}{2}-3\frac{1}{2}$	
2653.95	A	25	3.40	8.05	$4\frac{1}{2}-3\frac{1}{2}$	(121)	1450.177	A	10	3.40	11.91	$4\frac{1}{2}-4\frac{1}{2}$	
2642.80	A	20	3.45	8.12	$3\frac{1}{2}-4\frac{1}{2}$		1467.127	A	15	3.45	11.86	$3\frac{1}{2}-3\frac{1}{2}$	
2598.80	A	15	3.40	8.15	$4\frac{1}{2}-3\frac{1}{2}$	$b^4F -z^2F^\circ\uparrow$	1458.491	A	30	3.40	11.86	$4\frac{1}{2}-3\frac{1}{2}?$	
2553.49	A	8	3.45	8.28	$3\frac{1}{2}-2\frac{1}{2}$	(122)							
2626.41	A	30	3.45	8.15	$3\frac{1}{2}-3\frac{1}{2}$		Air						
2639.58	A	15	3.47	8.15	$2\frac{1}{2}-3\frac{1}{2}$		2897.713	A	40	3.58	7.84	$5\frac{1}{2}-5\frac{1}{2}$	$a^4G -z^4G^\circ\uparrow$
2576.99	A	10	3.40	8.19	$4\frac{1}{2}-3\frac{1}{2}$	$b^4F -y^4D^\circ$	2954.084	A	25	3.72	7.89	$4\frac{1}{2}-3\frac{1}{2}$	(139)
2621.28	A	20	3.52	8.23	$1\frac{1}{2}-0\frac{1}{2}$	(123)	2991.453	A	10	3.72	7.84	$4\frac{1}{2}-5\frac{1}{2}$	
2604.13	A	10	3.45	8.19	$3\frac{1}{2}-3\frac{1}{2}$		2992.083	A	15	3.76	7.88	$3\frac{1}{2}-4\frac{1}{2}$	
2460.18	A	20	3.47	8.49	$2\frac{1}{2}-2\frac{1}{2}$		2826.230	A	50	3.72	8.08	$4\frac{1}{2}-5\frac{1}{2}$	$a^4G -z^4I^\circ$
2617.08	A	40	3.47	8.19	$2\frac{1}{2}-3\frac{1}{2}$		2742.401	A	25	3.58	8.08	$5\frac{1}{2}-5\frac{1}{2}$	(140)
2457.19	A	20	3.40	8.42	$4\frac{1}{2}-3\frac{1}{2}$	$b^4F -x^4D^\circ\uparrow$	2826.674	A	50	3.58	7.95	$5\frac{1}{2}-4\frac{1}{2}$	
2583.07	A	20	3.45	8.23	$3\frac{1}{2}-2\frac{1}{2}$	(124)	2719.717	A	20	3.58	8.12	$5\frac{1}{2}-4\frac{1}{2}$	$a^4G -z^2G^\circ$
2565.69	A	40	3.47	8.28	$2\frac{1}{2}-1\frac{1}{2}$		2847.087	A	10	3.72	8.05	$4\frac{1}{2}-3\frac{1}{2}$	(141)
2524.39	A	20	3.52	8.41	$1\frac{1}{2}-0\frac{1}{2}$		2802.152	A	30	3.72	8.12	$4\frac{1}{2}-4\frac{1}{2}$	
2481.85	A	15	3.45	8.42	$3\frac{1}{2}-3\frac{1}{2}$		2829.092	A	20	3.76	8.12	$3\frac{1}{2}-4\frac{1}{2}$	
2595.81	A	50	3.47	8.23	$2\frac{1}{2}-2\frac{1}{2}$		2862.848	A	10h	3.74	8.05	$2\frac{1}{2}-3\frac{1}{2}$	
2589.43	A	100w	3.52	8.28	$1\frac{1}{2}-1\frac{1}{2}$		2736.826	A	60	3.58	8.09	$5\frac{1}{2}-6\frac{1}{2}$	$a^4G -z^2I^\circ$
2495.69	A	200	3.40	8.34	$4\frac{1}{2}-5\frac{1}{2}$	$b^4F -y^4G^\circ\uparrow$	2685.152	A	15	3.58	8.18	$5\frac{1}{2}-5\frac{1}{2}$	(142)
2549.171	A	100	3.45	8.29	$3\frac{1}{2}-4\frac{1}{2}$	(125)	2716.132	A	30	3.74	8.28	$2\frac{1}{2}-2\frac{1}{2}$	$a^4G -z^2F^\circ\uparrow$
2530.41	A	70	3.47	8.35	$2\frac{1}{2}-3\frac{1}{2}$		2798.779	A	25	3.74	8.15	$2\frac{1}{2}-3\frac{1}{2}$	(143)
2533.97	A	100	3.52	8.39	$1\frac{1}{2}-2\frac{1}{2}$		2760.745	A	20	3.76	8.23	$3\frac{1}{2}-2\frac{1}{2}$	$a^4G -x^4D^\circ\uparrow$
2501.95	A	100	3.40	8.33	$4\frac{1}{2}-5\frac{1}{2}$	$b^4F -z^2H^\circ$	2635.21	A	10	3.74	8.42	$2\frac{1}{2}-3\frac{1}{2}$	(144)
2488.57	A	30	3.45	8.41	$3\frac{1}{2}-4\frac{1}{2}$	(126)	2591.04	A	75	3.58	8.34	$5\frac{1}{2}-5\frac{1}{2}$	$a^4G -y^4G^\circ\uparrow$
2477.17	A	10	3.40	8.38	$4\frac{1}{2}-4\frac{1}{2}$	$b^4F -x^4F^\circ$	2697.12	A	10	3.72	8.29	$4\frac{1}{2}-4\frac{1}{2}$	(145)
2411.51	A	100	3.45	8.57	$3\frac{1}{2}-3\frac{1}{2}$	(127)	2686.889	A	15	3.76	8.35	$3\frac{1}{2}-3\frac{1}{2}$	
2408.44	A	50	3.47	8.60	$2\frac{1}{2}-2\frac{1}{2}$		2620.69	A	20	3.58	8.29	$5\frac{1}{2}-4\frac{1}{2}$	
*2430.94	A	50	3.52	8.60	$1\frac{1}{2}-1\frac{1}{2}$		2571.09	A	150	3.58	8.38	$5\frac{1}{2}-4\frac{1}{2}$	$a^4G -x^4F^\circ\uparrow$
2388.23	A	40	3.40	8.57	$4\frac{1}{2}-3\frac{1}{2}$		2543.47	A	100	3.72	8.57	$4\frac{1}{2}-3\frac{1}{2}$	(146)
2397.49	A	40	3.45	8.60	$3\frac{1}{2}-2\frac{1}{2}$		2549.79	A	80	3.76	8.60	$3\frac{1}{2}-2\frac{1}{2}$	
2401.02	A	20	3.40	8.54	$4\frac{1}{2}-4\frac{1}{2}$	$b^4F -y^2G^\circ\uparrow$	2542.04	A	25	3.74	8.60	$2\frac{1}{2}-1\frac{1}{2}$	
2424.56	A	70	3.45	8.54	$3\frac{1}{2}-4\frac{1}{2}$	(128)	2644.62	A	40	3.72	8.38	$4\frac{1}{2}-4\frac{1}{2}$	
2451.23	A	40	3.40	8.44	$4\frac{1}{2}-5\frac{1}{2}$	$b^4F -x^4G^\circ$	2556.08	A	30	3.74	8.57	$2\frac{1}{2}-3\frac{1}{2}$	
2440.80	A	80	3.45	8.51	$3\frac{1}{2}-4\frac{1}{2}$	(129)	2619.35	A	50	3.72	8.43	$4\frac{1}{2}-3\frac{1}{2}$	$a^4G -y^2G^\circ\uparrow$
2413.92	A	20	3.47	8.59	$2\frac{1}{2}-3\frac{1}{2}$		2642.88	A	30	3.76	8.43	$3\frac{1}{2}-3\frac{1}{2}$	(147)
2464.76	A	100	3.52	8.52	$1\frac{1}{2}-2\frac{1}{2}$		2632.73	A	25	3.74	8.43	$2\frac{1}{2}-3\frac{1}{2}$	
2416.96	A	120	3.40	8.51	$4\frac{1}{2}-4\frac{1}{2}$		2542.146	A	100	3.58	8.44	$5\frac{1}{2}-5\frac{1}{2}$	$a^4G -x^4G^\circ\uparrow$
2443.30	A	100Hw	3.47	8.52	$2\frac{1}{2}-2\frac{1}{2}$		2576.09	A	50	3.72	8.51	$4\frac{1}{2}-4\frac{1}{2}$	(148)
2441.61	A	30	3.52	8.57	$1\frac{1}{2}-0\frac{1}{2}$	$b^4F -z^2P^\circ\uparrow$	2555.93	A	30	3.76	8.59	$3\frac{1}{2}-3\frac{1}{2}$	
*2396.97	A	80	3.45	8.60	$3\frac{1}{2}-3\frac{1}{2}$	$b^4F -y^4H^\circ\uparrow$	2579.10	A	60	3.74	8.52	$2\frac{1}{2}-2\frac{1}{2}$	
*2373.96	A	20	3.40	8.60	$4\frac{1}{2}-3\frac{1}{2}$	(131)	2506.25	A	25	3.58	8.51	$5\frac{1}{2}-4\frac{1}{2}$	
2344.46	A	20	3.47	8.74	$2\frac{1}{2}-1\frac{1}{2}$	$b^4F -y^2D^\circ\uparrow$	*2615.05	A	75	3.72	8.44	$4\frac{1}{2}-5\frac{1}{2}$	
2355.97	A	20	3.47	8.71	$2\frac{1}{2}-2\frac{1}{2}$	(132)	2481.11	A	200	3.58	8.56	$5\frac{1}{2}-6\frac{1}{2}$	$a^4G -y^4H^\circ\uparrow$
2364.23	A	50	3.52	8.74	$1\frac{1}{2}-1\frac{1}{2}$		2527.86	A	200	3.72	8.60	$4\frac{1}{2}-5\frac{1}{2}$	(149)
2319.28	A	50h	3.52	8.84	$1\frac{1}{2}-2\frac{1}{2}$	$b^4F -y^2F^\circ$	2551.98	A	150	3.76	8.59	$3\frac{1}{2}-4\frac{1}{2}$	
2256.67	A	50	3.45	8.92	$3\frac{1}{2}-3\frac{1}{2}$	(133)	*2539.72	A	100	3.74	8.60	$2\frac{1}{2}-3\frac{1}{2}$	
						(134)	2460.59	A	20	3.58	8.60	$5\frac{1}{2}-5\frac{1}{2}$	
							2462.65	A	25	3.58	8.59	$5\frac{1}{2}-4\frac{1}{2}$	

Ru II—Continued

I A	Ref	Int	E P		J	Multiplet No.
			Low	High		
Air						
*2491.08	A	50	3.76	8.71	$3\frac{1}{2}-2\frac{1}{2}$	$a^4G -y^2D^\circ$
2469.25	A	20	3.74	8.74	$2\frac{1}{2}-1\frac{1}{2}?$	(150)
2369.83	A	10	3.58	8.79	$5\frac{1}{2}-5\frac{1}{2}$	$a^4G -y^2H^\circ$
2390.09	A	15	3.72	8.88	$4\frac{1}{2}-4\frac{1}{2}$	(151)
2432.16	A	40	3.72	8.79	$4\frac{1}{2}-5\frac{1}{2}$	
2409.68	A	25	3.76	8.88	$3\frac{1}{2}-4\frac{1}{2}$	
*2371.84	A	80	3.72	8.92	$4\frac{1}{2}-3\frac{1}{2}$	$a^4G -x^2F^\circ \dagger$
2391.10	A	20	3.76	8.92	$3\frac{1}{2}-3\frac{1}{2}$	(152)
2261.78	A	100	3.58	9.04	$5\frac{1}{2}-4\frac{1}{2}$	$a^4G -w^4F^\circ$
2322.57	A	20	3.72	9.03	$4\frac{1}{2}-3\frac{1}{2}$	(153)
2350.53	A	200	3.76	9.01	$3\frac{1}{2}-2\frac{1}{2}$	
2367.22	A	150	3.74	8.95	$2\frac{1}{2}-1\frac{1}{2}$	
2318.46	A	50	3.72	9.04	$4\frac{1}{2}-4\frac{1}{2}$	
*2341.06	A	100	3.76	9.03	$3\frac{1}{2}-3\frac{1}{2}$	
Vac						
1477.025	A	50	3.58	11.94	$5\frac{1}{2}-5\frac{1}{2}$	$a^4G -v^4G^\circ$
Air						
2977.471	A	25	4.03	8.17	$5\frac{1}{2}-6\frac{1}{2}$	$b^2H -z^4I^\circ \dagger$
*3036.463§	A	75	4.03	8.09	$5\frac{1}{2}-6\frac{1}{2}$	$b^2H -z^2I^\circ \dagger$
2978.638	A	50	4.04	8.18	$4\frac{1}{2}-5\frac{1}{2}$	(156)
2999.789	A	50	4.04	8.15	$4\frac{1}{2}-3\frac{1}{2}$	$b^2H -z^2F^\circ$
2863.261	A	50h	4.04	8.34	$4\frac{1}{2}-5\frac{1}{2}$	$b^2H -y^4G^\circ \dagger$
2866.276	A	15	4.03	8.33	$5\frac{1}{2}-5\frac{1}{2}$	$b^2H -z^2H^\circ \dagger$
2821.34	A	100	4.04	8.41	$4\frac{1}{2}-4\frac{1}{2}$	(159)
2871.493	A	30	4.04	8.33	$4\frac{1}{2}-5\frac{1}{2}$	
2833.806	A	50	4.03	8.38	$5\frac{1}{2}-4\frac{1}{2}$	$b^2H -x^4F^\circ$
2739.372	A	20	4.04	8.54	$4\frac{1}{2}-4\frac{1}{2}$	$b^2H -y^2G^\circ$
2755.258	A	20	4.03	8.51	$5\frac{1}{2}-4\frac{1}{2}$	$b^2H -x^4G^\circ \dagger$
2804.903	A	50	4.04	8.44	$4\frac{1}{2}-5\frac{1}{2}$	(162)
2724.864	A	100	4.03	8.56	$5\frac{1}{2}-6\frac{1}{2}$	$b^2H -y^4H^\circ$
2704.830	A	10	4.04	8.60	$4\frac{1}{2}-5\frac{1}{2}$	(163)
2700.163	A	50	4.03	8.60	$5\frac{1}{2}-5\frac{1}{2}$	
2707.310	A	50	4.04	8.59	$4\frac{1}{2}-4\frac{1}{2}$	
2702.639	A	10	4.03	8.59	$5\frac{1}{2}-4\frac{1}{2}$	
2704.192	A	15	4.04	8.60	$4\frac{1}{2}-3\frac{1}{2}$	
*2591.26	A	75	4.03	8.79	$5\frac{1}{2}-5\frac{1}{2}$	$b^2H -y^2H^\circ \dagger$
2547.66	A	20	4.04	8.88	$4\frac{1}{2}-4\frac{1}{2}$	(164)
2542.23	A	20	4.04	8.89	$4\frac{1}{2}-3\frac{1}{2}$	$b^2H -y^2F^\circ$
2471.05	A	30	4.04	9.03	$4\frac{1}{2}-3\frac{1}{2}$	$b^2H -w^4F^\circ$
2418.96	A	60	4.03	9.13	$5\frac{1}{2}-5\frac{1}{2}$	$b^2H -x^2H^\circ \dagger$
2453.82	A	60	4.03	9.06	$5\frac{1}{2}-4\frac{1}{2}$	(167)
2413.40	A	40	4.03	9.14	$5\frac{1}{2}-4\frac{1}{2}$	$b^2H -x^2G^\circ$
*2430.94	A	50	4.04	9.11	$4\frac{1}{2}-3\frac{1}{2}$	(168)
2339.92	A	15	4.03	9.30	$5\frac{1}{2}-4\frac{1}{2}$	$b^2H -w^2G^\circ$
2338.74	A	20	4.04	9.31	$4\frac{1}{2}-3\frac{1}{2}$	(169)
2343.43	A	30	4.04	9.30	$4\frac{1}{2}-4\frac{1}{2}$	

Ru II—Continued

I A	Ref	Int	E P		J	Multiplet No.
			Low	High		
Air						
*2315.90	A	50	4.03	9.36	$5\frac{1}{2}-6\frac{1}{2}$	$b^2H -y^2I^\circ$
2312.01	A	60H	4.04	9.37	$4\frac{1}{2}-5\frac{1}{2}?$	(170)
2308.63	A	40	4.03	9.37	$5\frac{1}{2}-5\frac{1}{2}$	
*2257.12	A	80	4.04	9.50	$4\frac{1}{2}-3\frac{1}{2}$	$b^2H -w^2F^\circ$
Vac						
1412.206	A	50	4.03	12.77	$5\frac{1}{2}-4\frac{1}{2}$	$b^2H -v^2G^\circ$
1424.934	A	50	4.04	12.70	$4\frac{1}{2}-3\frac{1}{2}$	(172)
Air						
2573.44	A	50	4.08	8.87	$2\frac{1}{2}-1\frac{1}{2}$	$b^4D -x^4P^\circ \dagger$
2624.17	A	40	4.08	8.78	$2\frac{1}{2}-2\frac{1}{2}$	(173)
*2591.26	A	75	4.08	8.84	$2\frac{1}{2}-2\frac{1}{2}$	$b^4D -y^2F^\circ \dagger$
2612.52	A	40	4.12	8.84	$3\frac{1}{2}-2\frac{1}{2}$	(174)
2568.88	A	100	4.12	8.92	$3\frac{1}{2}-3\frac{1}{2}$	$b^4D -x^2F^\circ \dagger$
2506.42	A	25	4.12	9.04	$3\frac{1}{2}-4\frac{1}{2}$	$b^4D -w^4F^\circ \dagger$
2491.56	A	40	4.08	9.03	$2\frac{1}{2}-3\frac{1}{2}$	(176)
2526.88	A	25	4.07	8.95	$0\frac{1}{2}-1\frac{1}{2}$	
*2502.30	A	40h	4.08	9.01	$2\frac{1}{2}-2\frac{1}{2}$	
2422.84	A	40	4.12	9.21	$3\frac{1}{2}-3\frac{1}{2}$	$b^4D -w^4D^\circ \dagger$
2482.78	A	60	4.08	9.05	$2\frac{1}{2}-2\frac{1}{2}$	(177)
2472.83	A	30	4.06	9.05	$1\frac{1}{2}-1\frac{1}{2}$	
2450.88	A	30	4.07	9.10	$0\frac{1}{2}-0\frac{1}{2}$	
*2502.30	A	40h	4.12	9.05	$3\frac{1}{2}-2\frac{1}{2}$	
2474.76	A	30	4.06	9.05	$1\frac{1}{2}-2\frac{1}{2}$	
2477.26	A	50	4.07	9.05	$0\frac{1}{2}-1\frac{1}{2}$	
2469.77	A	40	4.12	9.11	$3\frac{1}{2}-3\frac{1}{2}$	$b^4D -x^2G^\circ$
2785.87	A	25	4.16	8.60	$1\frac{1}{2}-1\frac{1}{2}$	$b^2P -x^4F^\circ \dagger$
2935.517	A	40	4.46	8.66	$0\frac{1}{2}-1\frac{1}{2}$	$b^2P -1^\circ$
2295.09	A	10	4.16	9.54	$1\frac{1}{2}-1\frac{1}{2}$	$b^2P -y^2P^\circ$
2426.59	A	50	4.46	9.54	$0\frac{1}{2}-1\frac{1}{2}$	(181)
2923.906	A	40	4.20	8.42	$3\frac{1}{2}-3\frac{1}{2}$	$b^2F -x^4D^\circ$
3035.792	A	15h	4.36	8.42	$2\frac{1}{2}-3\frac{1}{2}$	(182)
2933.232	A	50	4.20	8.41	$3\frac{1}{2}-4\frac{1}{2}$	$b^2F -z^2H^\circ$
2844.716	A	75	4.20	8.54	$3\frac{1}{2}-4\frac{1}{2}$	$b^2F -y^2G^\circ$
3032.442	A	7	4.36	8.43	$2\frac{1}{2}-3\frac{1}{2}$	(184)
2918.521	A	50	4.36	8.59	$2\frac{1}{2}-3\frac{1}{2}$	$b^2F -x^4G^\circ \dagger$
2961.538	A	20	4.36	8.52	$2\frac{1}{2}-2\frac{1}{2}$	(185)
2854.980	A	15	4.20	8.52	$3\frac{1}{2}-2\frac{1}{2}$	
2909.750	A	25	4.36	8.60	$2\frac{1}{2}-3\frac{1}{2}$	$b^2F -y^4H^\circ$
2736.456	A	40	4.20	8.71	$3\frac{1}{2}-2\frac{1}{2}$	$b^2F -y^2D^\circ \dagger$
2817.591	A	50	4.36	8.74	$2\frac{1}{2}-1\frac{1}{2}$	(187)
2616.33	A	25	4.20	8.92	$3\frac{1}{2}-3\frac{1}{2}$	$b^2F -x^2F^\circ \dagger$
2641.63	A	50	4.36	9.03	$2\frac{1}{2}-3\frac{1}{2}$	$b^2F -w^4F^\circ \dagger$

Ru III

I P 28.3 Anal C List A December 1960

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Ru III

Ru III

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Vac 1190.510 1200.067 1204.876 1207.173 1209.774 1211.306 1217.000 1216.238 1214.388	A A A A A A A A A	800 500 200 500 500 300 10 10 30	0.00 0.14 0.23 0.14 0.23 0.28 0.23 0.28 0.31	10.37 10.43 10.47 10.37 10.43 10.47 10.37 10.43 10.47	4-3 3-2 2-1 3-3 2-2 1-1 2-3 1-2 0-1	$4d^6\ ^5D - 5p\ ^5P^\circ$ (1)	Vac 1699.84 1653.77 1632.73 1703.29 1655.95 1634.13 1657.40 1634.99	A A A A A A A A	200h? 100h 20h 50 30h 30h 15h 15	9.71 9.50 9.39 9.71 9.50 9.39 9.50 9.39	16.97 16.96 16.95 16.96 16.95 16.94 16.94 16.94	4-5 3-4 2-3 4-4 3-3 2-2 3-2 2-1?	$5p\ ^7P^\circ - 5d\ ^7D$ (5)
1941.346 Air 2009.28 2044.59	A B B	500 500 (100)	3.35 3.35 3.35	9.71 9.50 9.39	3-4 3-3 3-2	$5s\ ^7S - 5p\ ^7P^\circ$ (2)	1700.42 1651.08 1627.98	A A A	50h? 10h 15h	9.71 9.50 9.39	16.97 16.97 16.97	4-3 3-3 2-3	$5p\ ^7P^\circ - 6s\ ^7S$ (6)
Vac 1759.49 1744.45	A A	200 50	3.35 3.35	10.37 10.43	3-3 3-2	$5s\ ^7S - 5p\ ^5P^\circ$ (3)	1795.52 1811.42	A A	20h 15h	10.37 10.43	17.25 17.25	3-2 2-2	$5p\ ^5P^\circ - 6s\ ^5S$ (7)
Air 2331.06 *2304.630\$ 2287.05	B B B	(300) (100) (400)	5.08 5.08 5.08	10.37 10.43 10.47	2-3 2-2 2-1	$5s\ ^5S - 5p\ ^5P^\circ$ (4)	1772.37 1787.00 1796.47 1771.49 1785.70 1801.04 1790.25	A A A A A A A	50h 15h 15h 20h 15h 5h 5h	10.37 10.43 10.47 10.37 10.43 10.47 10.43	17.33 17.34 17.34 17.34 17.34 17.33 17.33	3-4 2-3 1-2 3-3 2-2 1-1? 2-1?	$5p\ ^5P^\circ - 5d\ ^5D$ (8)

RHODIUM, $Z = 45$

Rh I

I P 7.43 Anal B List C August 1953

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 I multiplied by 10

Rh I

Rh I

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Air							Air						
*2889.104	A	60	0.19	4.46	$3\frac{1}{2}-3\frac{1}{2}$	$a^4F - 1^\circ$	2823.371	A	(25)	0.41	4.78	$2\frac{1}{2}-2\frac{1}{2}$	$a^2D - y^2D^\circ$
2981.116	A	(5)	0.32	4.46	$2\frac{1}{2}-3\frac{1}{2}$	(1)	2951.84	A	(1)	0.70	4.88	$1\frac{1}{2}-1\frac{1}{2}$	(17)
							2760.442	A	(30)	0.41	4.88	$2\frac{1}{2}-1\frac{1}{2}$	
2717.513	A	60	0.00	4.54	$4\frac{1}{2}-3\frac{1}{2}$	$a^4F - y^4D^\circ$	3023.911	A	100	0.70	4.78	$1\frac{1}{2}-2\frac{1}{2}$	
2819.626	A	(15)	0.19	4.57	$3\frac{1}{2}-2\frac{1}{2}$	(2)							
2820.836	A	(8)	0.32	4.70	$2\frac{1}{2}-1\frac{1}{2}$		2791.158	A	20	0.41	4.83	$2\frac{1}{2}-2\frac{1}{2}$	$a^2D - 6^\circ$
2856.164	A	40	0.43	4.75	$1\frac{1}{2}-0\frac{1}{2}$		2986.989	A	70	0.70	4.83	$1\frac{1}{2}-2\frac{1}{2}$	(18)
2835.44	A	35	0.19	4.54	$3\frac{1}{2}-3\frac{1}{2}$								
2907.209	A	130	0.32	4.57	$2\frac{1}{2}-2\frac{1}{2}$		2783.029	A	100	0.41	4.84	$2\frac{1}{2}-1\frac{1}{2}$	$a^2D - y^2P^\circ$
2892.220	A	(30)	0.43	4.70	$1\frac{1}{2}-1\frac{1}{2}$		2625.886	A	180	0.70	5.40	$1\frac{1}{2}-0\frac{1}{2}$	(19)
2924.024	A	140	0.32	4.54	$2\frac{1}{2}-3\frac{1}{2}$		2977.679	A	130	0.70	4.84	$1\frac{1}{2}-1\frac{1}{2}$	
2983.085	A	(35)	0.43	4.57	$1\frac{1}{2}-2\frac{1}{2}$								
*2728.946§	A	130	0.32	4.84	$2\frac{1}{2}-1\frac{1}{2}$	$a^4F - y^2P^\circ$	2740.554	A	(40)	0.41	4.91	$2\frac{1}{2}-2\frac{1}{2}$	$a^2D - 8^\circ$
2483.333	A	40	0.43	5.40	$1\frac{1}{2}-0\frac{1}{2}$	(3)	2929.107	A	100	0.70	4.91	$1\frac{1}{2}-2\frac{1}{2}$	(20)
2795.702	A	(15)	0.43	4.84	$1\frac{1}{2}-1\frac{1}{2}$								
							2912.616	A	60	0.70	4.94	$1\frac{1}{2}-2\frac{1}{2}$	$a^2D - 9^\circ$
													(21)
2652.662	A	320	0.32	4.97	$2\frac{1}{2}-3\frac{1}{2}$	$a^4F - y^2F^\circ$							
2694.314	A	40	0.43	5.01	$1\frac{1}{2}-2\frac{1}{2}$	(4)	2703.733	A	320	0.41	4.97	$2\frac{1}{2}-3\frac{1}{2}$	$a^2D - y^2F^\circ$
							2862.935	A	220	0.70	5.01	$1\frac{1}{2}-2\frac{1}{2}$	(22)
2382.89	A	100	0.00	5.18	$4\frac{1}{2}-4\frac{1}{2}$	$a^4F - 12^\circ$							
2473.086	A	100	0.19	5.18	$3\frac{1}{2}-4\frac{1}{2}$	(5)	2492.299	A	25	0.41	5.36	$2\frac{1}{2}-2\frac{1}{2}$	$a^2D - x^2D^\circ$
							2718.546	A	140	0.70	5.24	$1\frac{1}{2}-1\frac{1}{2}$	(23)
2361.92	A	80	0.00	5.23	$4\frac{1}{2}-4\frac{1}{2}$	$a^4F - 13^\circ$	2555.364	A	440	0.41	5.24	$2\frac{1}{2}-1\frac{1}{2}$	
						(6)	2647.281	A	90	0.70	5.36	$1\frac{1}{2}-2\frac{1}{2}$	
2448.835	A	50	0.32	5.36	$2\frac{1}{2}-2\frac{1}{2}$	$a^4F - x^2D^\circ$	2515.746	A	160	0.41	5.31	$2\frac{1}{2}-3\frac{1}{2}$	$a^2D - 16^\circ$
2509.697	A	280	0.32	5.24	$2\frac{1}{2}-1\frac{1}{2}$	(7)							(24)
2502.46	A	100	0.43	5.36	$1\frac{1}{2}-2\frac{1}{2}$								
							2462.69	A	(1)	0.41	5.42	$2\frac{1}{2}-3\frac{1}{2}$	$a^2D - x^2F^\circ$
2440.335	A	240	0.19	5.25	$3\frac{1}{2}-3\frac{1}{2}$	$a^4F - 14^\circ$	2622.576	A	120	0.70	5.40	$1\frac{1}{2}-2\frac{1}{2}$	(25)
2505.673	A	120	0.32	5.25	$2\frac{1}{2}-3\frac{1}{2}$	(8)	2470.391	A	60	0.41	5.40	$2\frac{1}{2}-2\frac{1}{2}$	
2322.58	A	60	0.00	5.31	$4\frac{1}{2}-4\frac{1}{2}$	$a^4F - 15^\circ$							
2408.186	A	12	0.19	5.31	$3\frac{1}{2}-4\frac{1}{2}$	(9)	2931.941	A	100	0.70	4.91	$3\frac{1}{2}-2\frac{1}{2}$	$a^2F - 8^\circ$
							3124.402	A	(5)	0.96	4.91	$2\frac{1}{2}-2\frac{1}{2}$	(26)
2407.884	A	40	0.19	5.31	$3\frac{1}{2}-3\frac{1}{2}$	$a^4F - 16^\circ$							
2471.472	A	70	0.32	5.31	$2\frac{1}{2}-3\frac{1}{2}$	(10)	2915.419	A	70	0.70	4.94	$3\frac{1}{2}-2\frac{1}{2}$	$a^2F - 9^\circ$
													(27)
2427.685	A	80	0.32	5.40	$2\frac{1}{2}-2\frac{1}{2}$	$a^4F - x^2F^\circ$							
						(11)	2889.841	A	60	0.70	4.97	$3\frac{1}{2}-3\frac{1}{2}$	$a^2F - y^2F^\circ$
							3049.217	A	(5)	0.96	5.01	$2\frac{1}{2}-2\frac{1}{2}$	(28)
2429.516	A	140	0.43	5.51	$1\frac{1}{2}-1\frac{1}{2}$	$a^4F - 18^\circ$							
						(12)	2649.593	A	(1)	0.70	5.36	$3\frac{1}{2}-2\frac{1}{2}$	$a^2F - x^2D^\circ$
							2885.975	A	60	0.96	5.24	$2\frac{1}{2}-1\frac{1}{2}$	(29)
							2805.787	A	(20)	0.96	5.36	$2\frac{1}{2}-2\frac{1}{2}$	
2986.202	A	360	0.41	4.54	$2\frac{1}{2}-3\frac{1}{2}$	$a^2D - y^4D^\circ$	2449.038	A	40	0.70	5.74	$3\frac{1}{2}-4\frac{1}{2}$	$a^2F - 22^\circ$
3191.187	A	400	0.70	4.57	$1\frac{1}{2}-2\frac{1}{2}$	(13)							(30)
2968.663	A	180	0.41	4.57	$2\frac{1}{2}-2\frac{1}{2}$								
3087.415	A	25	0.70	4.70	$1\frac{1}{2}-1\frac{1}{2}$								
2878.658	A	90	0.41	4.70	$2\frac{1}{2}-1\frac{1}{2}$								
2864.404	A	50	0.41	4.72	$2\frac{1}{2}-1\frac{1}{2}$	$a^2D - z^2P^\circ$							
3152.603	A	40	0.70	4.61	$1\frac{1}{2}-0\frac{1}{2}$	(14)	2882.366	A	110	1.14	5.42	$2\frac{1}{2}-3\frac{1}{2}$	$a^4P - x^2F^\circ$
3071.027	A	(20)	0.70	4.72	$1\frac{1}{2}-1\frac{1}{2}$		2987.449	A	40	1.27	5.40	$1\frac{1}{2}-2\frac{1}{2}$	(31)
2880.760	A	60	0.41	4.69	$2\frac{1}{2}-3\frac{1}{2}$	$a^2D - 3^\circ$	2826.677	A	140	1.14	5.50	$2\frac{1}{2}-3\frac{1}{2}$	$a^4P - 17^\circ$
						(15)							(32)
2827.312	A	25	0.41	4.77	$2\frac{1}{2}-1\frac{1}{2}$	$a^2D - 4^\circ$	2741.75	A	60	1.14	5.64	$2\frac{1}{2}-2\frac{1}{2}$	$a^4P - 20^\circ$
3028.406	A	40	0.70	4.77	$1\frac{1}{2}-1\frac{1}{2}$	(16)	2826.430	A	120	1.27	5.64	$1\frac{1}{2}-2\frac{1}{2}$	(33)
							2779.538	A	60	1.27	5.71	$1\frac{1}{2}-1\frac{1}{2}$	$a^4P - 21^\circ$
							2834.121	A	60	1.36	5.71	$0\frac{1}{2}-1\frac{1}{2}$	(34)

Rh II

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REFERENCES

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 M. A. Catalán and F. R. Rico, unpublished material (December 1956). I P
 * and § = Blend with Rh II.

Rh II

Rh II

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Vac							Vac						
1768.42	A	100	0.00	6.98	4-4	$a^3F - z^5F^\circ \uparrow$	1808.64	A	100	1.01	7.83	2-3	$a^1D - z^3F^\circ$
1787.07	A	40	0.30	7.20	3-3	(1)	1760.37	A	50	1.01	8.02	2-2	(14)
1690.29	A	50	0.00	7.30	4-4	$a^3F - z^5D^\circ \uparrow$	1765.09	A	80	1.01	8.00	2-3	$a^1D - z^3D^\circ$
1654.31	A	30	0.00	7.46	4-3	(2)	1726.69	A	90	1.01	8.16	2-2	(15)
1761.80	A	20	0.30	7.30	3-4		1706.34	A	20	1.01	8.24	2-1	
1674.22	A	100	0.00	7.37	4-5	$a^3F - z^5G^\circ \uparrow$							
1701.50	A	20	0.30	7.55	3-4	(3)							
1634.72	A	200	0.00	7.55	4-4		1799.74	A	80	1.30	8.16	1-2	$a^3P - z^3D^\circ \uparrow$
1679.58	A	50	0.30	7.65	3-3		1785.42	A	100	1.33	8.24	0-1	(16)
1703.37	A	50	0.44	7.69	2-2		1777.62	A	80	1.30	8.24	1-1	
1607.86	A	100	0.00	7.68	4-5	$a^3F - z^3G^\circ$	1584.00	A	90	1.30	9.09	1-1	$a^3P - z^3P^\circ \uparrow$
1624.47	A	200	0.30	7.90	3-4	(4)	1623.01	A	100	1.30	8.90	1-2	(17)
1619.70	A	20	0.44	8.06	2-3		1590.19	A	40	1.33	9.09	0-1	
1563.48	A	100	0.00	7.90	4-4		1594.35	A	100	1.44	9.18	2-3	$a^3P - z^1F^\circ$
1589.32	A	90	0.30	8.06	3-3								(18)
1530.91	A	100	0.00	8.06	4-3								
1604.45	A	500	0.00	7.69	4-4	$a^3F - z^3F^\circ$							
1637.88	A	200	0.30	7.83	3-3	(5)	1680.41	A	90	1.83	9.18	4-3	$a^1G - z^1F^\circ$
1628.94	A	500	0.44	8.02	2-2								(19)
1575.91	A	100	0.00	7.83	4-3		1663.22	A	100	1.83	9.26	4-4	$a^1G - y^3G^\circ$
1598.23	A	50	0.30	8.02	3-2								(20)
*1668.76	A	100	0.30	7.69	3-4		1621.18	A	100	1.83	9.45	4-5	$a^1G - z^3I^\circ$
1670.19	A	90	0.44	7.83	2-3								(21)
1542.74	A	100	0.00	8.00	4-3	$a^3F - z^3D^\circ$	1555.10	A	90	1.83	9.77	4-3	$a^1G - x^3F^\circ$
1570.41	A	100	0.30	8.16	3-2	(6)							(22)
1582.57	A	90	0.44	8.24	2-1		1500.74	A	100	1.83	10.06	4-4	$a^1G - y^1G^\circ$
1602.10	A	40	0.30	8.00	3-3								(23)
1600.06	A	50	0.44	8.16	2-2		*1471.10	A	100	1.83	10.23	4-5	$a^1G - y^1H^\circ$
1632.96	A	100	0.44	8.00	2-3								(24)
1408.34	A	90	0.00	8.77	4-4	$a^3F - y^5D^\circ \uparrow$							
1493.40	A	40	0.44	8.71	2-1	(7)							
*1412.74	A	100	0.30	9.03	3-3	$a^3F - y^3D^\circ \uparrow$							
						(8)							
1349.47	A	100	0.30	9.44	3-4	$a^3F - x^3G^\circ \uparrow$	Air						
1351.10	A	60	0.44	9.58	2-3	(9)	2490.79	A	150	2.08	7.04	5-5	$a^5F - z^5F^\circ \uparrow$
							2630.33	A	100	2.29	6.98	4-4	(25)
*1412.74	A	100	0.44	9.18	2-3	$a^3F - z^1F^\circ \uparrow$	2592.16	A	100	2.44	7.20	3-3	
						(10)	2559.92	A	100	2.55	7.37	2-2	
1342.13	A	200	0.00	9.20	4-5	$a^3F - y^3G^\circ \uparrow$	2537.73	A	100	2.61	7.48	1-1	
1332.79	A	30	0.00	9.26	4-3	(11)	2520.52	A	100	2.08	6.98	5-4	
1315.23	A	90	0.00	9.39	4-3	$a^3F - w^3D^\circ \uparrow$	2510.65	A	100	2.29	7.20	4-3	
1358.60	A	50	0.30	9.38	3-2	(12)	2505.12	A	100	2.44	7.37	3-2	
1358.11	A	50	0.30	9.39	3-3		2503.85	A	100	2.55	7.48	2-1	
							2650.93	A	30	2.55	7.20	2-3	
							*2595.40	A	60	2.61	7.37	1-2	
1749.58	A	100	1.01	8.06	2-3	$a^1D - z^3G^\circ$							(13)

Rh II—Continued

Rh II—Continued

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Air							Air						
2364.67	A	100	2.08	7.30	5-4	$a^5F - z^5D^{\circ}\dagger$	2190.91	A	200	3.13	8.77	4-4	$b^3F - y^5D^{\circ}\dagger$
2385.45	A	200	2.29	7.46	4-3	(26)	2258.27	A	80	3.39	8.85	3-3	(37)
2405.22	A	150	2.44	7.57	3-2		2276.20	A	100	3.39	8.81	3-2	
2424.43	A	80	2.55	7.64	2-1		2294.66	A	70	3.39	8.77	3-4	
2448.29	A	100	2.61	7.66	1-0								
2461.03	A	300	2.29	7.30	4-4		*2298.26	A	150	3.56	8.93	2-1	$b^3F - z^3S^{\circ}$
*2458.90	A	300	2.44	7.46	3-3								(38)
2455.71	A	200	2.55	7.57	2-2		2091.07	A	100	3.13	9.03	4-3	$b^3F - y^5D^{\circ}\dagger$
2456.18	A	100	2.61	7.64	1-1								(39)
2488.29	A	50	2.61	7.57	1-2								
2334.77†	A	1000	2.08	7.37	5-6	$a^5F - z^5G^{\circ}$	Vac						
2427.09	A	300	2.29	7.37	4-5	(27)	1974.15	A	100	3.13	9.39	4-3	$b^3F - w^3D^{\circ}\dagger$
2415.84	A	500	2.44	7.55	3-4		Air						(40)
2421.00	A	500	2.55	7.65	2-3		2119.21	A	100	3.56	9.38	2-2	
*2431.85	A	300	2.61	7.69	1-2								
2333.30	A	300	2.08	7.37	5-5								
2344.89	A	80	2.29	7.55	4-4								
2400.71	A	80	2.55	7.69	2-2		2764.83	A	100	3.43	7.90	3-4	$a^5P - z^3G^{\circ}$
2257.24	A	80	2.08	7.55	5-4		*2664.48	A	50	3.43	8.06	3-3	(41)
2303.47	A	20	2.29	7.65	4-3		2803.95	A	80	3.43	7.83	3-3	$a^5P - z^3F^{\circ}\dagger$
2352.44	A	50	2.44	7.69	3-2		2689.61	A	100	3.43	8.02	3-2	(42)
2206.35	A	100	2.08	7.68	5-5	$a^5F - z^3G^{\circ}\dagger$							
2201.02	A	100	2.29	7.90	4-4	(28)	*2819.24	A	100	3.43	7.81	3-2	$a^5P - z^5S^{\circ}$
2290.04	A	300	2.29	7.68	4-5		2845.73	A	100	3.47	7.81	2-2	(43)
2263.43	A	50	2.44	7.90	3-4		2924.10	A	200	3.59	7.81	1-2	
2237.71	A	50	2.55	8.06	2-3								
2199.96	A	200	2.08	7.69	5-4	$a^5F - z^3F^{\circ}\dagger$	2700.61	A	90	3.43	8.00	3-3	$a^5P - z^3D^{\circ}\dagger$
2212.79	A	80	2.44	8.02	3-2	(29)	2651.91	A	100	3.59	8.24	1-1	(44)
2350.35	A	100	2.44	7.69	3-4		*2587.30	A	100	3.47	8.24	2-1	
2282.87	A	50	2.61	8.02	1-2								
*2192.78	A	100	2.61	8.24	1-1	$a^5F - z^3D^{\circ}\dagger$	2417.41	A	150	3.43	8.54	3-3	$a^5P - z^5P^{\circ}\dagger$
2226.55	A	100	2.61	8.16	1-2	(30)	*2443.69	A	100	3.47	8.52	2-2	(45)
							2444.74	A	100	3.47	8.52	2-1	
Vac							2436.86	A	100	3.47	8.54	2-3	
1975.71	A	100	2.29	8.54	4-3	$a^5F - z^3P^{\circ}\dagger$	2366.88	A	100	3.43	8.65	3-4	$a^5P - y^3F^{\circ}\dagger$
Air						(31)	2246.38	A	80	3.43	8.93	3-3	(46)
2029.90	A	50	2.44	8.52	3-2								
Vac							*2294.12	A	200	3.47	8.85	2-3	$a^5P - y^5D^{\circ}\dagger$
1881.36	A	100	2.08	8.65	5-4	$a^5F - y^3F^{\circ}\dagger$	2276.89	A	150	3.43	8.85	3-3	(47)
*1941.82	A	50	2.29	8.65	4-4	(32)	*2312.65	A	150	3.47	8.81	2-2	
							2410.69	A	200	3.59	8.71	1-1	
							2430.80	A	100	3.59	8.67	1-0	
Air													
2910.15	A	200	3.13	7.37	4-5	$b^3F - z^5G^{\circ}\dagger$	2255.25	A	60	3.43	8.90	3-2	$a^5P - z^3P^{\circ}\dagger$
2963.54	A	200	3.39	7.55	3-4	(33)	2321.86	A	100	3.59	8.90	1-2	(48)
3019.78	A	100	3.56	7.65	2-3								
2792.78	A	100	3.13	7.55	4-4		2202.71	A	50	3.43	9.03	3-3	$a^5P - y^3D^{\circ}\dagger$
*2897.63	A	100	3.39	7.65	3-3		2288.24	A	50	3.59	8.98	1-1	(49)
							2232.98	A	50	3.43	8.96	3-2	
2715.27	A	150	3.13	7.68	4-5	$b^3F - z^3G^{\circ}\dagger$	*2298.26	A	150	3.59	8.96	1-2	
2737.40	A	150	3.39	7.90	3-4	(34)							
2739.92	A	150	3.56	8.06	2-3		2177.08	A	100	3.43	9.10	3-2	$a^5P - y^3P^{\circ}\dagger$
							*2192.78	A	100	3.47	9.10	2-2	(50)
2705.60	A	150	3.13	7.69	4-4	$b^3F - z^3F^{\circ}\dagger$	2198.79	A	100	3.59	9.20	1-1	
2775.77	A	100	3.39	7.83	3-3	(35)							
2766.54	A	100	3.56	8.02	2-2								
2625.41	A	150	3.13	7.83	4-3		2420.18	A	100	4.18	9.28	3-2	$a^3G - y^3F^{\circ}\dagger$
2663.69	A	100	3.39	8.02	3-2								(51)
2534.57	A	90	3.13	8.00	4-3	$b^3F - z^3D^{\circ}$	2545.36	A	100	3.92	8.77	5-4	$a^3G - y^5D^{\circ}\dagger$
*2587.30	A	100	3.39	8.16	3-2	(36)	2603.31	A	100	4.03	8.77	4-4	(52)
2635.28	A	100	3.56	8.24	2-1								
2674.43	A	100	3.39	8.00	3-3		2475.63	A	300	3.92	8.90	5-6	$a^3G - z^3H^{\circ}\dagger$
2684.21	A	100	3.56	8.16	2-2		2628.14	A	100	4.03	8.72	4-5	(53)
2778.15	A	100	3.56	8.00	2-3		2609.17	A	100	4.18	8.91	3-4	
							2569.10	A	70	3.92	8.72	5-5	
							2429.95	A	200	3.92	9.00	5-4	$a^3G - z^1G^{\circ}$
							2482.73	A	100	4.03	9.00	4-4	(54)

Rh II—Continued

Rh II—Continued

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Air							Air						
2463.44	A	150	4.03	9.03	4-3	$a^3G -y^3D^\circ$	*2305.95	A	100wh	4.49	9.84	2-2	$c^3P -z^1D^\circ \dagger$
2541.16	A	30	4.18	9.03	3-3	(55)							(74)
2396.55	A	300	3.92	9.07	5-5	$a^3G -x^3G^\circ \dagger$	*2312.65	A	150	4.53	9.87	1-2	$c^3P -y^1D^\circ \dagger$
2277.24	A	60	4.03	9.44	4-4	(56)							(75)
2285.00	A	50	4.18	9.58	3-3								
*2221.97	A	100	4.03	9.58	4-3		2132.24	A	100	4.49	10.28	2-1	$c^3P -x^3P^\circ \dagger$
2447.85	A	100	4.03	9.07	4-5								(76)
*2336.84	A	150	3.92	9.20	5-5	$a^3G -y^3G^\circ \dagger$							
2359.18	A	100	4.03	9.26	4-4	(57)							
							2926.80	A	100	4.50	8.72	4-5	$b^1G -z^3H^\circ$
							2802.30	A	100	4.50	8.91	4-4	(77)
2626.62	A	100	4.23	8.93	2-3	$b^3P -y^3F^\circ$	2747.63	A	100	4.50	9.00	4-4	$b^1G -z^1G^\circ$
*2443.69	A	100	4.23	9.28	2-2	(58)							(78)
*2728.94§	A	100	4.29	8.81	1-2	$b^3P -y^5D^\circ \dagger$	*2431.85	A	300	4.50	9.58	4-3	$b^1G -x^3G^\circ \dagger$
2754.09	A	80	4.23	8.71	2-1	(59)							(79)
2411.94	A	200	4.23	9.34	2-3	$b^3P -x^3D^\circ \dagger$	2597.09	A	100	4.50	9.26	4-4	$b^1G -y^3G^\circ \dagger$
2361.96	A	80	4.23	9.45	2-2	(60)	2593.66	A	80	4.50	9.26	4-3	(80)
*2221.97	A	100	4.29	9.84	1-2	$b^3P -z^1D^\circ$	2284.07	A	150	4.50	9.91	4-4	$b^1G -y^3H^\circ \dagger$
						(61)							(81)
2946.61	A	90	4.81	9.00	4-4	$a^3H -z^1G^\circ \dagger$	2221.42	A	100	4.50	10.06	4-4	$b^1G -y^1G^\circ$
						(62)							(82)
2654.76	A	80	4.42	9.07	6-5	$a^3H -x^3G^\circ$	2717.97	A	100	4.56	9.10	3-2	$a^3D -y^3P^\circ$
2517.51	A	100	4.54	9.44	5-4	(63)							(83)
2586.41	A	100	4.81	9.58	4-3		2797.01	A	100	4.77	9.18	2-3	$a^3D -z^1F^\circ \dagger$
*2897.63	A	100	4.81	9.07	4-5								(84)
2581.70	A	150	4.42	9.20	6-5	$a^3H -y^3G^\circ \dagger$	2557.21	A	100	4.56	9.39	3-3	$a^3D -w^3D^\circ \dagger$
2774.18	A	80	4.81	9.26	4-4	(64)	2669.20	A	90	4.78	9.40	1-1	(85)
2491.88	A	150	4.42	9.37	6-7	$a^3H -z^3I^\circ$	2444.06	A	150	4.56	9.61	3-4	$a^3D -x^3F^\circ \dagger$
2659.10	A	100	4.81	9.45	4-5	(65)	2466.15	A	100	4.77	9.77	2-3	(86)
2515.32	A	80	4.54	9.45	5-5		*2336.84	A	150	4.56	9.84	3-2	$a^3D -z^1D^\circ \dagger$
2485.82	A	100	4.81	9.77	4-3	$a^3H -x^3F^\circ$							(87)
						(66)	2324.86	A	100	4.56	9.87	3-2	$a^3D -y^1D^\circ \dagger$
2408.73	A	200	4.54	9.67	5-6	$a^3H -z^1I^\circ \dagger$							(88)
						(67)							
2327.67	A	300	4.42	9.72	6-6	$a^3H -y^3H^\circ \dagger$							
2346.43	A	200	4.54	9.80	5-5	(68)							
2383.59	A	300	4.54	9.72	5-6		*2819.24	A	100	5.07	9.44	5-4	$a^1H -x^3G^\circ \dagger$
2349.69	A	200	4.81	10.06	4-4	$a^3H -y^1G^\circ$							(89)
						(69)	2683.58	A	150	5.07	9.67	5-6	$a^1H -z^1I^\circ$
													(90)
2781.82	A	100	4.49	8.93	2-3	$c^3P -y^3F^\circ \dagger$	2549.66	A	100	5.07	9.91	5-4	$a^1H -y^3H^\circ \dagger$
						(70)							(91)
2681.60	A	150	4.49	9.09	2-1	$c^3P -z^3P^\circ \dagger$	2471.89	A	100	5.07	10.06	5-4	$a^1H -y^1G^\circ$
						(71)							(92)
2761.28	A	100	4.49	8.96	2-2	$c^3P -y^3D^\circ \dagger$	2392.43	A	100	5.07	10.23	5-5	$a^1H -y^1H^\circ$
2773.07	A	80	4.53	8.98	1-1	(72)							(93)
2676.28	A	100	4.49	9.10	2-2	$c^3P -y^3P^\circ \dagger$	2713.30	A	90	5.29	9.84	2-2	$b^1D -z^1D^\circ$
						(73)							(94)

PALLADIUM, $Z = 46$

Pd I

I P 8.30 Anal A List C March 1953

REFERENCES

- A A. G. Shenstone, Proc. Roy. Soc. [A] **219**, 419 (March 1953). W L, I, T
 B W. F. Meggers, see A. G. Shenstone, Phys. Rev. **36**, 669 (1930). W L, (I), I P

Pd I

Pd I

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Air 2763.08	B	(100R)	0.00	4.47	0-1	$4d^{10} 1S - 5p \ ^3P^\circ$ (1)	Vac 1929.55 *1974.90	A A	100h 100	0.81 0.96	7.21 7.21	3-3 2-3	$5s \ ^3D-6p \ ^1F^\circ$ (10)
2476.43	B	(50R)	0.00	4.98	0-1	$4d^{10} 1S - 5p \ ^3D^\circ$ (2)	1973.93	A	100	0.96	7.21	2-2	$5s \ ^3D-14^\circ \dagger$ (11)
2447.95	B	(10R)	0.00	5.04	0-1	$4d^{10} 1S - 5p \ ^1P^\circ$ (3)	1901.94 1945.99	A A	150 200	0.81 0.96	7.30 7.30	3-3 2-3	$5s \ ^3D-15^\circ$ (12)
							Air 2019.82	A	200	1.25	7.36	1-1, 2	$5s \ ^3D-16^\circ \dagger$ (13)
2922.50	B	(40)	0.81	5.03	3-2	$5s \ ^3D-5p \ ^1D^\circ$ (4)							
3027.92	B	(100)	0.96	5.03	2-2		Vac 1923.95	A	100	0.96	7.37	2-2	$5s \ ^3D-17^\circ$ (14)
3258.80	B	(300)	1.25	5.03	1-2								
2254.28	B	(15)	0.81	6.28	3-3	$5s \ ^3D-5^\circ$ (5)	1890.41	A	150	0.96	7.49	2-2	$5s \ ^3D-29^\circ$ (15)
2178.29	A	150	0.81	6.48	3-3	$5s \ ^3D-1^\circ \dagger$ (6)	*1974.90	A	100	1.25	7.50	1-1, 2	$5s \ ^3D-18^\circ \dagger$ (16)
2092.63	A	100	0.81	6.71	3-4	$5s \ ^3D-6p \ ^3F^\circ \dagger$ (7)							
2172.95	A	50	0.96	6.64	2-3								
Vac 1993.20	A	50	0.96	7.15	2-2		1976.50	A	150	1.45	7.69	2-3	$5s \ ^1D-5p' \ ^1F^\circ$ (17)
1972.74	A	300	0.81	7.07	3-3	$5s \ ^3D-9^\circ$ (8)	1968.33	A	200	1.45	7.72	2-2	$5s \ ^1D-5p' \ ^1D^\circ$ (18)
Air 2019.55	A	300	0.96	7.07	2-3								
Vac 1960.75	A	150	0.81	7.11	3-2	$5s \ ^3D-10^\circ$ (9)							
Air 2007.00	A	200	0.96	7.11	2-2								
2105.87	A	200	1.25	7.11	1-2								

Pd II

I P 19.34 Anal A List C March 1953

REFERENCES

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 B F. Exner and E. Haschek, see Ref. A.
 M. A. Catalán y F. A. Rico, An. Real Soc. Esp. Fis. y Quim. (Madrid) [A] 48, 328 (1952). I P

Pd II

Pd II

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Vac							Air						
1403.59	A	25	0.00	8.80	$2\frac{1}{2}-3\frac{1}{2}$	$4d^9\ ^2D\ -5p\ ^4F^\circ\uparrow$	2231.59	B	100R	3.10	8.63	$4\frac{1}{2}-4\frac{1}{2}$	$5s\ ^4F\ -5p\ ^4F^\circ\uparrow$
1437.29	A	30	0.44	9.03	$1\frac{1}{2}-2\frac{1}{2}$	(1)	2264.33	B	40	3.34	8.80	$3\frac{1}{2}-3\frac{1}{2}$	(15)
1367.76	A	25	0.00	9.03	$2\frac{1}{2}-2\frac{1}{2}$								
1453.25	A	10	0.44	8.93	$1\frac{1}{2}-1\frac{1}{2}$								
1315.57	A	25	0.00	9.17	$2\frac{1}{2}-3\frac{1}{2}$	$4d^9\ ^2D\ -5p\ ^2G^\circ$	2854.59	B	200	3.98	8.31	$3\frac{1}{2}-4\frac{1}{2}$	$5s\ ^2F\ -5p\ ^4G^\circ\uparrow$
						(2)	2841.02	B	30	4.25	8.59	$2\frac{1}{2}-3\frac{1}{2}$	(16)
1374.92	A	50	0.00	8.98	$2\frac{1}{2}-2\frac{1}{2}$	$4d^9\ ^2D\ -5p\ ^2D^\circ\uparrow$	2658.75	B	150	3.98	8.63	$3\frac{1}{2}-4\frac{1}{2}$	$5s\ ^2F\ -5p\ ^4F^\circ\uparrow$
1397.46	A	15	0.44	9.27	$1\frac{1}{2}-1\frac{1}{2}$	(3)	2565.51	B	150	3.98	8.80	$3\frac{1}{2}-3\frac{1}{2}$	(17)
1363.76	A	20	0.00	9.05	$2\frac{1}{2}-3\frac{1}{2}$	$4d^9\ ^2D\ -5p\ ^2F^\circ\uparrow$	2498.81	B	200	3.98	8.92	$3\frac{1}{2}-4\frac{1}{2}$	$5s\ ^2F\ -5p\ ^2G^\circ\uparrow$
1320.05	A	35	0.00	9.35	$2\frac{1}{2}-2\frac{1}{2}$	(4)	2505.73	B	150	4.25	9.17	$2\frac{1}{2}-3\frac{1}{2}$	(18)
1365.80	A	25	0.44	9.48	$1\frac{1}{2}-1\frac{1}{2}$	$4d^9\ ^2D\ -5p'\ ^4P^\circ\uparrow$	2471.18	B	100	3.98	8.98	$3\frac{1}{2}-2\frac{1}{2}$	$5s\ ^2F\ -5p\ ^2D^\circ\uparrow$
1365.58	A	15	0.44	9.48	$1\frac{1}{2}-2\frac{1}{2}$	(5)	2457.76	B	60	4.25	9.27	$2\frac{1}{2}-1\frac{1}{2}$	(19)
1254.59	A	20	0.00	9.84	$2\frac{1}{2}-3\frac{1}{2}$	$4d^9\ ^2D\ -5p''\ ^2F^\circ$	2435.32	B	100	3.98	9.05	$3\frac{1}{2}-3\frac{1}{2}$	$5s\ ^2F\ -5p\ ^2F^\circ\uparrow$
1329.34	A	5	0.44	9.72	$1\frac{1}{2}-2\frac{1}{2}$	(6)	2418.72	B	75	4.25	9.35	$2\frac{1}{2}-2\frac{1}{2}$	(20)
1269.62	A	10	0.00	9.72	$2\frac{1}{2}-2\frac{1}{2}$		2569.56	B	100	4.25	9.05	$2\frac{1}{2}-3\frac{1}{2}$	
1235.23	A	15	0.00	9.99	$2\frac{1}{2}-1\frac{1}{2}$	$4d^9\ ^2D\ -5p''\ ^2P^\circ$							
1314.61	A	5	0.44	9.83	$1\frac{1}{2}-0\frac{1}{2}$?	(7)	2469.29	B	150	4.48	9.48	$2\frac{1}{2}-2\frac{1}{2}$	$5s'\ ^4P\ -5p'\ ^4P^\circ\uparrow$
1218.66	A	15	0.00	10.13	$2\frac{1}{2}-2\frac{1}{2}$	$4d^9\ ^2D\ -5p''\ ^2D^\circ\uparrow$	2470.06	B	80	4.48	9.48	$2\frac{1}{2}-1\frac{1}{2}$	(21)
1273.60	A	10	0.44	10.07	$1\frac{1}{2}-2\frac{1}{2}$	(8)	2534.57	B	80	4.61	9.48	$1\frac{1}{2}-0\frac{1}{2}$	
1204.00	A	30	0.00	10.25	$2\frac{1}{2}-3\frac{1}{2}$	$4d^9\ ^2D\ -5p'\ ^4D^\circ\uparrow$							
1267.27	A	10	0.44	10.18	$1\frac{1}{2}-2\frac{1}{2}$	(9)							
1214.58	A	10	0.00	10.16	$2\frac{1}{2}-1\frac{1}{2}$		2433.11	B	100	5.49	10.57	$4\frac{1}{2}-5\frac{1}{2}$	$5s'''\ ^2G\ -5p'''\ ^2H^\circ\uparrow$
							2551.84	B	150	5.51	10.34	$3\frac{1}{2}-4\frac{1}{2}$	(22)
1237.12	A	15	0.44	10.42	$1\frac{1}{2}-1\frac{1}{2}$	$4d^9\ ^2D\ -5p'\ ^2D^\circ\uparrow$							
1245.92	A	5	0.44	10.35	$1\frac{1}{2}-2\frac{1}{2}$	(10)							
1174.37	A	20	0.00	10.51	$2\frac{1}{2}-1\frac{1}{2}$	$4d^9\ ^2D\ -5p'\ ^2P^\circ$	2776.85	B	150h	8.47	12.91	$5\frac{1}{2}-4\frac{1}{2}$	$5p\ ^4G^\circ\ -6s\ ^4F\uparrow$
1183.45	A	20	0.44	10.87	$1\frac{1}{2}-0\frac{1}{2}$	(11)	2630.30	B	20h	8.31	13.00	$4\frac{1}{2}-3\frac{1}{2}$	(23)
1225.33	A	10	0.44	10.51	$1\frac{1}{2}-1\frac{1}{2}$								
1162.20	A	15	0.00	10.62	$2\frac{1}{2}-3\frac{1}{2}$	$4d^9\ ^2D\ -5p'''\ ^2F^\circ$							
1196.43	A	10	0.44	10.76	$1\frac{1}{2}-2\frac{1}{2}$	(12)	2878.01	B	100h	8.63	12.91	$4\frac{1}{2}-4\frac{1}{2}$	$5p\ ^4F^\circ\ -6s\ ^4F\uparrow$
							2935.01	B	20h	8.80	13.00	$3\frac{1}{2}-3\frac{1}{2}$	(24)
Air													
2488.92	B	300	3.10	8.05	$4\frac{1}{2}-3\frac{1}{2}$	$5s\ ^4F\ -5p\ ^4D^\circ\uparrow$	2787.92	B	100h	8.92	13.35	$4\frac{1}{2}-3\frac{1}{2}$	$5p\ ^2G^\circ\ -6s\ ^2F\uparrow$
2446.17	B	150	3.34	8.39	$3\frac{1}{2}-2\frac{1}{2}$	(13)	2807.59	B	50h	9.17	13.57	$3\frac{1}{2}-2\frac{1}{2}$	(25)
2426.87	B	100	3.57	8.66	$2\frac{1}{2}-1\frac{1}{2}$								
2424.49	B	75	3.70	8.79	$1\frac{1}{2}-0\frac{1}{2}$								
2296.53†	B	200R	3.10	8.47	$4\frac{1}{2}-5\frac{1}{2}$	$5s\ ^4F\ -5p\ ^4G^\circ\uparrow$	2871.37	B	100h	9.05	13.35	$3\frac{1}{2}-3\frac{1}{2}$	$5p\ ^2F^\circ\ -6s\ ^2F\uparrow$
2486.52	B	250	3.34	8.31	$3\frac{1}{2}-4\frac{1}{2}$	(14)	2925.41	B	10h	9.35	13.57	$2\frac{1}{2}-2\frac{1}{2}$	(26)
2457.29	B	100	3.57	8.59	$2\frac{1}{2}-3\frac{1}{2}$								
2430.94	B	100	3.70	8.77	$1\frac{1}{2}-2\frac{1}{2}$								

Pd III

I P 32.79 Anal B List B March 1961

REFERENCE

A A. G. Shenstone, unpublished material (February 1957). I P, T, W L, I, C L
 * and § = Possibly a blend of Pd II and Pd III.

Pd III

Pd III

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Vac							Vac						
916.779	A	200	0.00	13.47	4-5	$a^3F - z^5G^\circ \dagger$	*813.989	A	150d?	0.40	15.56	3-2	$a^3F - y^3P^\circ$
902.900	A	400	0.00	13.67	4-4?	(1)	*816.563	A	200	0.58	15.70	2-1	(14)
922.492	A	200	0.40	13.78	3-3								
889.294	A	1000	0.00	13.88	4-4	$a^3F - z^3F^\circ$	783.344	A	100	0.00	15.76	4-3	$a^3F - x^3D^\circ$
904.365	A	400	0.40	14.05	3-3	(2)	796.384	A	150	0.40	15.90	3-2	(15)
900.490	A	300	0.58	14.29	2-2		799.013	A	200	0.58	16.03	2-1	
878.732	A	400	0.00	14.05	4-3		*803.665	A	500	0.40	15.76	3-3	
915.582	A	200	0.40	13.88	3-4		805.725	A	40	0.58	15.90	2-2	
916.467	A	100	0.58	14.05	2-3		813.192	A	100	0.58	15.76	2-3	
*888.842	A	500	0.00	13.89	4-5	$a^3F - z^3G^\circ$	*781.019§	A	1000l	0.00	15.81	4-3	$a^3F - w^3D^\circ$
895.599	A	100	0.40	14.18	3-4	(3)	*800.095	A	500	0.40	15.83	3-2	(16)
894.197	A	30	0.58	14.38	2-3		807.672	A	50	0.58	15.86	2-1	
870.437	A	150	0.00	14.18	4-4		801.223	A	50	0.40	15.81	3-3	
882.690	A	50	0.40	14.38	3-3		809.536	A	100	0.58	15.83	2-2	
858.238	A	100	0.00	14.38	4-3								
864.044	A	500	0.00	14.29	4-3	$a^3F - z^3D^\circ$	766.424	A	500l	0.00	16.11	4-4	$a^3F - x^3F^\circ \dagger$
880.590	A	500	0.40	14.42	3-2	(4)	776.315	A	100l	0.40	16.30	3-3	(17)
885.913	A	300	0.58	14.51	2-1		*794.078	A	500	0.58	16.13	2-2	
*888.842	A	500	0.40	14.29	3-3		784.985	A	200	0.40	16.13	3-2	
892.029	A	100	0.58	14.42	2-2		785.883	A	150	0.40	16.11	3-4	
873.057	A	200	0.58	14.72	2-1	$a^3F - z^5P^\circ \dagger$	772.110	A	200l	0.40	16.39	3-2	$a^3F - z^1D^\circ$
					(5)							(18)	
814.524	A	100	0.00	15.16	4-4	$a^3F - z^3H^\circ \dagger$	738.793	A	150	0.00	16.71	4-3	$a^3F - y^1F^\circ$
					(6)		756.853	A	100	0.40	16.71	3-3	(19)
825.345	A	500	0.00	14.96	4-4	$a^3F - y^3F^\circ \dagger$	707.797	A	150	0.00	17.44	4-3	$a^3F - v^3D^\circ \dagger$
*826.411	A	400	0.40	15.34	3-3	(7)	719.474	A	100	0.40	17.56	3-2	(20)
815.053	A	200	0.58	15.72	2-2		727.720	A	200l	0.58	17.54	2-1	
847.943	A	50	0.40	14.96	3-4								
836.476	A	100	0.58	15.34	2-3								
820.342	A	75	0.00	15.05	4-4	$a^3F - y^5D^\circ \dagger$	965.506	A	300	1.26	14.05	2-3	$a^1D - z^3F^\circ$
845.268	A	50	0.58	15.18	2-2	(8)	947.795	A	300	1.26	14.29	2-2	(21)
809.695	A	150	0.00	15.25	4-3		917.442	A	100	1.26	14.72	2-1	$a^1D - z^5P^\circ \dagger$
834.978	A	50	0.40	15.18	3-2								(22)
854.354	A	100	0.58	15.03	2-1								
*803.665	A	500	0.00	15.36	4-4	$a^3F - z^1G^\circ$	886.820	A	100	1.26	15.18	2-2	$a^1D - y^5D^\circ \dagger$
825.076	A	150	0.40	15.36	3-4	(9)	*896.813	A	200	1.26	15.03	2-1?	(23)
802.286	A	150	0.00	15.39	4-3	$a^3F - y^3D^\circ \dagger$	867.699	A	100	1.26	15.49	2-1	$a^1D - z^3P^\circ \dagger$
					(10)								(24)
*801.542	A	200	0.00	15.40	4-5	$a^3F - y^3G^\circ \dagger$	837.146	A	200	1.26	16.01	2-3	$a^1D - y^3G^\circ$
*801.542	A	200	0.40	15.80	3-4?	(11)							(25)
800.011	A	500	0.58	16.01	2-3		866.075	A	150	1.26	15.52	2-3	$a^1D - z^1F^\circ$
797.517	A	500	0.00	15.48	4-5	$a^3F - x^3G^\circ \dagger$	863.200	A	200	1.26	15.56	2-2	$a^1D - y^3P^\circ$
787.950	A	100	0.00	15.67	4-4?	(12)	855.294	A	150	1.26	15.70	2-1	(27)
*807.827	A	150	0.40	15.68	3-3								
787.276	A	200	0.00	15.68	4-3?		851.593	A	200	1.26	15.76	2-3	$a^1D - x^3D^\circ \dagger$
													(28)
795.585	A	50	0.00	15.52	4-3	$a^3F - z^1F^\circ$	848.868	A	200	1.26	15.81	2-3?	$a^1D - w^3D^\circ \dagger$
*816.563	A	200	0.40	15.52	3-3	(13)	845.525	A	100	1.26	15.86	2-1	(29)
*826.411	A	400	0.58	15.52	2-3								

Pd III—Continued

Pd III—Continued

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Vac 820.012	A	100	1.26	16.32	2-1	$a^1D - y^3S^\circ$ (30)	Vac 717.904 711.944 709.885	A A A	100 100 100	1.81 1.66 1.69	19.00 19.00 19.08	2-2 1-2 0-1	$a^3P - w^3P^\circ \dagger$ (53)
816.221	A	200	1.26	16.39	2-2	$a^1D - z^1D^\circ$ (31)							
*800.095	A	500	1.26	16.69	2-2	$a^1D - x^3P^\circ$ (32)	972.682	A	100	2.21	14.90	4-5	$a^1G - z^3H^\circ$ (54)
799.202	A	200	1.26	16.71	2-3	$a^1D - y^1F^\circ$ (33)	908.871	A	100	2.21	15.79	4-5	$a^1G - z^3F^\circ$ (55)
790.192	A	150	1.26	16.89	2-1	$a^1D - y^1P^\circ$ (34)	930.142	A	100	2.21	15.48	4-5	$a^1G - x^3G^\circ \dagger$ (56)
787.837	A	100	1.26	16.93	2-3	$a^1D - x^1F^\circ$ (35)	927.512	A	100	2.21	15.52	4-3	$a^1G - z^1F^\circ$ (57)
780.115	A	1001	1.26	17.09	2-2	$a^1D - w^3F^\circ$ (36)	914.858	A	100	2.21	15.70	4-5	$a^1G - z^1H^\circ$ (58)
763.058 758.308	A A	5001? 100	1.26 1.26	17.44 17.54	2-3 2-1	$a^1D - v^3D^\circ \dagger$ (37)	875.931	A	100	2.21	16.30	4-3	$a^1G - x^3F^\circ$ (59)
1008.385 977.805	A A	150 100	1.81 1.66	14.05 14.29	2-3 1-2	$a^3P - z^3F^\circ$ (38)	873.977 865.285	A A	200 200	2.21 2.21	16.33 16.47	4-5 4-4	$a^1G - y^3H^\circ$ (60)
989.103 967.854 962.753 960.643	A A A A	100 200 100 100	1.81 1.66 1.69 1.66	14.29 14.42 14.51 14.51	2-3 1-2 0-1 1-1	$a^3P - z^3D^\circ$ (39)	856.470	A	500	2.21	16.62	4-4	$a^1G - y^1G^\circ$ (61)
892.793	A	150	1.66	15.49	1-1	$a^3P - z^3P^\circ \dagger$ (40)	851.247	A	200	2.21	16.71	4-3	$a^1G - y^1F^\circ$ (62)
*896.813	A	200	1.66	15.43	1-1	$a^3P - y^3D^\circ$ (41)	840.579	A	500	2.21	16.89	4-5	$a^1G - y^1H^\circ$ (63)
900.423	A	150	1.81	15.52	2-3	$a^3P - z^1F^\circ$ (42)	1914.616 Air 2026.520 Vac	A A A	4000 250	6.53 6.80	12.98 12.89	5-5 4-4	$a^5F - z^5F^\circ \dagger$ (64)
867.087	A	100	1.66	15.90	1-2	$a^3P - x^3D^\circ \dagger$ (43)	1993.956 1968.639 1951.117 1941.639	A A A A	200 150 200 2000	7.00 7.14 7.23 6.53	13.20 13.41 13.55 12.89	3-3 2-2 1-1 5-4	
*871.491 871.061	A A	75 100	1.66 1.69	15.83 15.86	1-2? 0-1	$a^3P - w^3D^\circ \dagger$ (44)	1930.330 *1926.770 1925.472	A A A	1000 500 300	6.80 7.00 7.14	13.20 13.41 13.55	4-3 3-2 2-1	
851.743 *853.610	A A	300 50	1.81 1.81	16.30 16.13	2-3? 2-2	$a^3P - x^3F^\circ \dagger$ (45)	1811.605 1830.311 1845.020 1856.504 1875.469 1885.834 1887.398 1883.352 1880.326 1946.507	A A A A A A A A A A	150 100 50 50 100 2000 1000 500 300 50	6.53 6.80 7.00 7.14 7.23 6.80 7.00 7.14 7.23 7.00	13.35 13.55 13.70 13.79 13.81 13.35 13.55 13.70 13.79 13.35	5-4 4-3 3-2 2-1 1-0 4-4 3-3 2-2 1-1 3-4	$a^5F - z^5D^\circ \dagger$ (65)
847.342	A	100	1.66	16.23	1-0?	$a^3P - z^1S^\circ$ (46)							
840.214	A	100	1.69	16.38	0-1	$a^3P - z^1P^\circ$ (47)							
836.948	A	100	1.66	16.41	1-2	$a^3P - y^1D^\circ$ (48)							
829.316 806.317 *813.989 *807.827	A A A A	300 50 150d? 150	1.81 1.66 1.81 1.69	16.69 16.97 16.97 16.97	2-2 1-1 2-1 0-1	$a^3P - x^3P^\circ \dagger$ (49)	1782.548 1852.274 1851.592 1859.206 1877.027 1780.617 1796.616 1821.839	A A A A A A A A	4000 2000 1500 1000 400 200 100 50	6.53 6.80 7.00 7.14 7.23 6.53 6.80 7.00	13.46 13.47 13.67 13.78 13.80 13.47 13.67 13.78	5-6 4-5 3-4 2-3 1-2 5-5 4-4 3-3	$a^5F - z^5G^\circ \dagger$ (66)
818.679	A	200	1.81	16.89	2-1	$a^3P - y^1P^\circ \dagger$ (50)							
*794.078	A	500	1.81	17.35	2-2?	$a^3P - x^1D^\circ \dagger$ (51)	1795.083	A	150	7.00	13.88	3-4	$a^5F - z^3F^\circ \dagger$ (67)
789.583 776.681 778.783 783.805 777.367	A A A A A	200 1501 501 150 1501	1.81 1.66 1.69 1.81 1.66	17.44 17.56 17.54 17.56 17.54	2-3 1-2 0-1 2-2 1-1?	$a^3P - v^3D^\circ$ (52)	1741.619 1719.856 1704.330	A A A	500 200 100	6.80 7.00 7.14	13.89 14.18 14.38	4-5 3-4 2-3	$a^5F - z^3G^\circ \dagger$ (68)

Pd III—Continued

Pd III—Continued

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Vac 1727.375 1716.367	A A	100 50h	7.14 7.23	14.29 14.42	2-3 1-2	$a^5F - z^3D^{\circ}\dagger$ (69)	Vac 1708.568	A	100	8.11	15.34	3-3	$a^5P - y^3F^{\circ}\dagger$ (86)
1535.308 1579.741	A A	300 100	6.80 7.00	14.84 14.82	4-3 3-2	$a^5F - z^5P^{\circ}\dagger$ (70)	1779.629 1732.634 1790.772	A A A	300 250 100	8.11 8.12 8.29	15.05 15.25 15.18	3-4 2-3 1-2	$a^5P - y^5D^{\circ}\dagger$ (87)
1449.625 1565.202 1584.160	A A A	100 200 50	6.53 7.14 7.23	15.05 15.03 15.02	5-4 2-1 1-0	$a^5F - y^5D^{\circ}\dagger$ (71)	1832.067 1834.832	A A	150 100	8.29 8.29	15.03 15.02	1-1 1-0?	
							1585.033 *1616.290 1622.114	A A A	50h 200d? 50h	8.11 8.12 8.29	15.90 15.76 15.90	3-2 2-3? 1-2	$a^5P - x^3D^{\circ}$ (88)
Air 2149.143 2197.412 2074.546	A A A	500 200 200	7.72 8.06 7.72	13.47 13.67 13.67	4-5 3-4 4-4	$b^3F - z^5G^{\circ}\dagger$ (72)	1604.319 1601.893	A A	100h 100	8.11 8.12	15.81 15.83	3-3? 2-2	$a^5P - w^3D^{\circ}\dagger$ (89)
2123.684	A	200	8.06	13.87	3-2	$b^3F - z^5S^{\circ}\dagger$ (73)	1874.629	A	1500	8.64	15.23	5-6	$a^3G - z^3H^{\circ}\dagger$ (90)
2003.827 2059.227	A A	1000 150	7.72 8.06	13.88 14.05	4-4 3-3	$b^3F - z^3F^{\circ}\dagger$ (74)	Air 2013.831 Vac *2000.553 1972.296	A A A A	500 300 300	8.77 8.99 8.64	14.90 15.16 14.90	4-5 3-4 5-5	
Vac 1951.500 1980.882	A A	400 200	7.72 8.06	14.05 14.29	4-3 3-2		1954.039 1880.064 1831.753 1995.443 1943.000	A A A A A	300 250 200 150 50	8.64 8.77 8.99 8.77 8.99	14.96 15.34 15.72 14.96 15.34	5-4 4-3 3-2 4-4 3-3	$a^3G - y^3F^{\circ}\dagger$ (91)
Air 2001.516 2014.226 2022.013	A A A	1000 500 300	7.72 8.06 8.28	13.89 14.18 14.38	4-5 3-4 2-3	$b^3F - z^3G^{\circ}$ (75)	1836.672 1873.197	A A	250 200	8.64 8.77	15.36 15.36	5-4 4-4	$a^3G - z^1G^{\circ}$ (92)
Vac 1880.547 1940.447 1980.703 1980.939	A A A A	50 50 200 300	7.72 8.06 8.28 8.06	14.29 14.42 14.51 14.29	4-3? 3-2 2-1 3-3	$b^3F - z^3D^{\circ}$ (76)	1865.782	A	150	8.77	15.39	4-3	$a^3G - y^3D^{\circ}$ (93)
Air 2010.978	A	250	8.28	14.42	2-2		1804.908 1789.987 1843.940 1840.166 1847.473	A A A A A	400 200 250 50 250	8.64 8.77 8.99 8.77 8.99	15.48 15.67 15.68 15.48 15.67	5-5 4-4 3-3 4-5 3-4	$a^3G - x^3G^{\circ}\dagger$ (94)
Vac 1819.274	A	150	8.06	14.84	3-3	$b^3F - z^5P^{\circ}\dagger$ (77)	1781.262	A	150	8.77	15.70	4-5	$a^3G - z^1H^{\circ}\dagger$ (95)
1765.403	A	200	8.06	15.05	3-4	$b^3F - y^5D^{\circ}\dagger$ (78)							
*1616.290 1689.838	A A	200d? 50	7.72 8.06	15.36 15.36	4-4? 3-4	$b^3F - z^1G^{\circ}$ (79)							
1610.745 1683.821	A A	50h 200h	7.72 8.06	15.39 15.39	4-3 3-3	$b^3F - y^3D^{\circ}\dagger$ (80)	Air 2150.673	A	150	8.98	14.72	2-1	$b^3P - z^5P^{\circ}\dagger$ (96)
Air 2144.305 2147.995 2212.809	A A A	300 200 100	8.11 8.12 8.29	13.87 13.87 13.87	3-2 2-2 1-2	$a^5P - z^5S^{\circ}$ (81)	Vac *1926.770 1944.123 1972.575	A A A	500 50 100	8.98 9.01 9.17	15.39 15.36 15.43	2-3 1-2 0-1	$b^3P - y^3D^{\circ}\dagger$ (97)
Vac 1998.812	A	200	8.11	14.29	3-2	$a^5P - z^3F^{\circ}$ (82)	1808.544	A	250	8.98	15.81	2-3	$b^3P - w^3D^{\circ}\dagger$ (98)
Air 2032.776	A	250	8.11	14.18	3-4	$a^5P - z^3G^{\circ}\dagger$ (83)	1996.550 1922.443 1956.892	A A A	400 250 150	9.22 9.38 9.70	15.40 15.80 16.01	6-5 5-4 4-3	$a^3H - y^3G^{\circ}$ (99)
Vac 1998.880	A	200	8.11	14.29	3-3	$a^5P - z^3D^{\circ}\dagger$ (84)	1891.341 Air 2032.054 2026.705	A A A	1500 500 500	9.22 9.38 9.70	15.75 15.45 15.79	6-7 5-6 4-5	$a^3H - z^3I^{\circ}\dagger$ (100)
1834.386 1843.148 1840.438 1871.263 1837.073	A A A A A	200 150 50 100 200	8.11 8.12 8.11 8.12 8.12	14.84 14.82 14.82 14.72 14.84	3-3 2-2 3-2 2-1 2-3	$a^5P - z^5P^{\circ}\dagger$ (85)	Vac 1971.752 1962.861	A A	200 150	9.22 9.38	15.48 15.67	6-5 5-4	$a^3H - x^3G^{\circ}\dagger$ (101)

Pd III—Continued

Pd III—Continued

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Vac 1818.464	A	200	9.38	16.17	5-6	$a^3H - z^1I^\circ$ (102)	Air 2118.887	A	150	9.98	15.80	5-4	$a^1H - y^3G^\circ$ (121)
1758.187	A	400	9.22	16.24	6-6	$a^3H - y^3H^\circ \uparrow$ (103)	Vac 1993.845	A	400	9.98	16.17	5-6	$a^1H - z^1I^\circ$ (122)
1775.162	A	300	9.38	16.33	5-5		1857.558	A	200	9.98	16.62	5-4	$a^1H - y^1G^\circ$ (123)
1822.515	A	200	9.70	16.47	4-4		1784.367	A	300	9.98	16.89	5-5	$a^1H - y^1H^\circ$ (124)
1799.107	A	100	9.38	16.24	5-6		1986.874	A	150	10.20	16.41	1-2	$a^1P - y^1D^\circ$ (125)
Air 2110.422	A	200	9.31	15.16	4-4	$b^1G - z^3H^\circ$ (104)	1922.522	A	100	10.27	16.69	2-2	$b^1D - x^3P^\circ \uparrow$ (126)
2038.970	A	100	9.31	15.36	4-4	$b^1G - z^1G^\circ$ (105)	1917.472	A	200	10.27	16.71	2-3	$b^1D - y^1F^\circ$ (127)
2025.390	A	100	9.31	15.40	4-5	$b^1G - y^3G^\circ \uparrow$ (106)	1815.574	A	250	10.71	17.51	4-5	$c^3F - w^3G^\circ \uparrow$ (128)
Vac *2000.553	A	300	9.31	15.48	4-5	$b^1G - x^3G^\circ \uparrow$ (107)	Air 2009.864	A	50	10.55	16.69	2-3	$c^3F - x^1D^\circ$ (130)
1941.332	A	100	9.31	15.67	4-4		Vac 1913.729	A	150	10.71	17.17	4-4	
1988.426	A	200	9.31	15.52	4-3	$b^1G - z^1F^\circ$ (108)	Air 2066.985	A	150	10.71	16.69	4-3	$c^3F - w^3F^\circ \uparrow$ (129)
1931.090	A	400	9.31	15.70	4-5	$b^1G - z^1H^\circ$ (109)	1812.094	A	150	10.71	17.53	4-4	
1722.735	A	150	9.31	16.47	4-4	$b^1G - y^3H^\circ \uparrow$ (110)	1830.063	A	150	10.60	17.34	3-3	
*1999.101	A	100	9.31	15.49	2-1	$c^3P - z^3P^\circ \uparrow$ (111)	1886.978	A	50	10.55	17.09	2-2	$c^3F - x^1D^\circ$ (131)
Air 2032.333	A	200	9.31	15.39	2-3	$c^3P - y^3D^\circ \uparrow$ (112)	1813.523	A	150	10.55	17.35	2-2	
2040.802	A	100	9.31	15.36	2-2		1811.975	A	200	10.60	17.41	3-4	$c^3F - v^3D^\circ \uparrow$ (132)
Vac 1975.354	A	150	9.31	15.56	2-2	$c^3P - y^3P^\circ \uparrow$ (113)	1835.265	A	150	10.71	17.44	4-3	
1957.187	A	50	9.39	15.70	1-1		1803.315	A	150	10.60	17.44	3-3	$a^1F - x^1F^\circ$ (133)
*1999.101	A	100	9.39	15.56	1-2	$c^3P - z^1D^\circ$ (114)	Air 2150.931	A	150	11.19	16.93	3-3	
1745.562	A	150	9.31	16.39	2-2	$c^3P - x^1F^\circ$ (115)	Vac 1986.718	A	100	11.19	17.41	3-4	$a^1F - x^1G^\circ$ (134)
1620.629	A	100	9.31	16.93	2-3	$a^3D - z^3P^\circ \uparrow$ (116)	1917.281	A	150	12.89	19.33	3-3	$b^3D - w^3D^\circ$ (135)
Air 2123.302	A	100	9.41	15.22	3-2?		1545.957	A	500	12.98	20.97	5-5	$z^5F^\circ - e^5F^\uparrow$ (136)
2103.508	A	100	9.65	15.52	2-3	$a^3D - z^1F^\circ \uparrow$ (117)	1517.185	A	200h	12.89	21.03	4-4	
Vac 1944.537	A	200	9.41	15.76	3-3	$a^3D - x^3D^\circ \uparrow$ (118)	1534.092	A	100	12.98	21.03	5-4	$z^5D^\circ - e^3F$ (137)
1975.190	A	200	9.65	15.90	2-2		1526.252	A	100	13.35	21.44	4-4?	
1843.490	A	400	9.41	16.11	3-4	$a^3D - x^3F^\circ \uparrow$ (119)							
1856.161	A	200	9.65	16.30	2-3								
1904.721	A	75	9.64	16.13	1-2	$a^3D - z^1P^\circ$ (120)							
1833.300	A	100	9.65	16.38	2-1								

SILVER, $Z = 47$

Ag I

I P 7.54 Anal A List C July 1952

REFERENCE

A A. G. Shenstone, Phys. Rev. 57, 897 (1940). W L, I, T, I P

Ag I

Ag I

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Air							Air						
2061.168	A	200	0.00	5.99	$0\frac{1}{2}-1\frac{1}{2}$	$5s\ 2S - 6p\ 2P^\circ$	2824.39	A	100U	3.73	8.10	$2\frac{1}{2}-3\frac{1}{2}$	$5s^2\ 2D - 5p'\ 2F^\circ$
2069.850	A	100	0.00	5.96	$0\frac{1}{2}-0\frac{1}{2}$	(1)							(8)
Vac							2721.77	A	50	3.73	8.27	$2\frac{1}{2}-2\frac{1}{2}$	$5s^2\ 2D - 5p'\ 2D^\circ$
1847.73	A	20	0.00	6.68	$0\frac{1}{2}-1\frac{1}{2}$	$5s\ 2S - 7p\ 2P^\circ$							(9)
1850.47	A	5	0.00	6.67	$0\frac{1}{2}-0\frac{1}{2}$	(2)	2375.02	A	50UU	3.73	8.93	$2\frac{1}{2}-3\frac{1}{2}$	$5s^2\ 2D - 5p''\ 2F^\circ$
1709.26	A	50	0.00	7.22	$0\frac{1}{2}-1\frac{1}{2}$	$5s\ 2S - 5p'\ 4P^\circ$							(10)
1651.87	A	100u	0.00	7.47	$0\frac{1}{2}-0\frac{1}{2}$	(3)	2312.60	A	10UU	3.73	9.07	$2\frac{1}{2}-1\frac{1}{2}$	$5s^2\ 2D - 5p''\ 2P^\circ$
1766.20	A	10u	0.00	6.99	$0\frac{1}{2}-0\frac{1}{2}$	$5s\ 2S - 8p\ 2P^\circ$							(11)
						(4)	2575.63	A	50U	4.29	9.08	$1\frac{1}{2}-2\frac{1}{2}$	$5s^2\ 2D - 5p''\ 2D^\circ$
1574.02	A	5	0.00	7.84	$0\frac{1}{2}-1\frac{1}{2}$	$5s\ 2S - 5p'\ 4D^\circ$	2309.56	A	30U	3.73	9.08	$2\frac{1}{2}-2\frac{1}{2}$	(12)
1548.58	A	50RUU	0.00	7.97	$0\frac{1}{2}-0\frac{1}{2}$	(5)							
1515.63	A	100RUU	0.00	8.15	$0\frac{1}{2}-$	$5s\ 2S - 5p'\ 2P^\circ$							
						(6)							
1507.37	A	50RUU	0.00	8.19	$0\frac{1}{2}-1\frac{1}{2}$	$5s\ 2S - 5p'\ 2D^\circ$							
						(7)							

Ag II

I P 21.4 Anal A List C March 1952

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 E F. Exner und E. Haschek, see References A and C above. W L
 F H. E. White, see Ref. A. W L, (I)
 G O. S. Duffendack and K. Thomson, see Ref. B. W L, (I), T

Ag II

Ag II

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Vac 1195.87	F	(50)	0.00	10.32	0-1	$4d^{10} 1S - 5p^3 P^{\circ}$ (1)	Air 2477.25 2681.38	E E	25u 20u	9.90 10.32	14.88 14.93	2-3 1-2	$5p^3 P^{\circ} - 6s^3 D^{\dagger}$ (17)
1107.05	F	(25)	0.00	11.15	0-1	$4d^{10} 1S - 5p^3 D^{\circ}$ (2)	2202.09 2383.17	A E	40u 8u	9.90 10.32	15.50 15.50	2-1 1-1	$5p^3 P^{\circ} - 5d^3 S^{\dagger}$ (18)
1112.46	F	(80)	0.00	11.10	0-1	$4d^{10} 1S - 5p^1 P^{\circ}$ (3)	*2145.76 2226.02	A A	20u 15	9.90 10.32	15.65 15.87	2-2 1-0	$5p^3 P^{\circ} - 5d^3 P^{\dagger}$ (19)
752.80	G	(30)	0.00	16.40	0-1	$4d^{10} 1S - 6p^3 P^{\circ}$ (4)	2125.50 2277.43 2203.64	A E A	18u 10u 15u	9.90 10.32 10.63	15.70 15.74 16.23	2-3 1-2 0-1	$5p^3 P^{\circ} - 5d^3 D^{\dagger}$ (20)
730.83	G	(25)	0.00	16.89	0-1	$4d^{10} 1S - 6p^1 P^{\circ}$ (5)							
							2712.07 2580.77 2614.56 2606.14 2938.55	E E E E E	40u 35u 15u 15u 15u	10.33 10.14 10.73 10.14 10.73	14.88 14.93 15.45 14.88 14.93	4-3 3-2 2-1 3-3 2-2	$5p^3 F^{\circ} - 6s^3 D$ (21)
Air 2437.81 2331.40 2357.92 2535.30 2506.63 2743.92	E E E E E E	100R 80R 70 30 60 15	4.83 5.03 5.40 5.03 5.40 5.40	9.90 10.32 10.63 9.90 10.32 9.90	3-2 2-1 1-0 2-2 1-1 1-2	$5s^3 D - 5p^3 P^{\circ}$ (6)	2325.12 2246.14 2253.45	E A E	40u 20u? 30u	10.33 10.14 10.73	15.64 15.64 16.20	4-5 3-4 2-3	$5p^3 F^{\circ} - 5d^3 G^{\dagger}$ (22)
2246.43† 2413.23 2317.05 2324.68 2166.51	E E E E A	100R 90R 70R 70R 45	4.83 5.03 5.40 4.83 5.03	10.33 10.14 10.73 10.14 10.73	3-4 2-3 1-2 3-3 2-2	$5s^3 D - 5p^3 F^{\circ}$ (7)	2275.32 2205.95 2208.49 2462.26	E A A E	25u 35u 15u 20u	10.33 10.14 10.73 10.73	15.75 15.74 16.31 15.74	4-4 3-3 2-2 2-3	$5p^3 F^{\circ} - 5d^3 F$ (23)
2113.82 2248.74 2145.60 2171.66 2015.89 2186.76 2411.41	A A A A A A E	80R 75R 60 10 15 50 75	4.83 5.03 5.40 4.83 5.03 5.03 5.40	10.67 10.52 11.15 10.52 11.15 10.67 10.52	3-3 2-2 1-1 3-2 2-1 2-3 1-2	$5s^3 D - 5p^3 D^{\circ\dagger}$ (8)	2934.24 2799.70 2873.62 2902.09	E E E E	30u 30u 20u 20u	10.67 10.52 11.15 10.67	14.88 14.93 15.45 14.93	3-3 2-2 1-1 3-2	$5p^3 D^{\circ} - 6s^3 D^{\dagger}$ (24)
2000.68 2065.90	A A	20 40	4.83 5.03	11.00 11.00	3-3 2-3	$5s^3 D - 5p^1 F^{\circ}$ (9)	2170.87	A	25u	10.52	16.20	2-3	$5p^3 D^{\circ} - 5d^3 G^{\dagger}$ (25)
2120.45 Vac 1994.32	A A	40 20	5.40 5.03	11.22 11.22	1-2 2-2	$5s^3 D - 5p^1 D^{\circ}$ (10)	2480.41 2405.00 2617.01 2743.78	E E D D	20u 8u 12 10	10.67 10.52 11.15 11.15	15.65 15.65 15.87 15.65	3-2 2-1 1-0 1-1	$5p^3 D^{\circ} - 5d^3 P$ (26)
							2453.31 2362.20	E E	30u 20u	10.67 10.52	15.70 15.74	3-3 2-2	$5p^3 D^{\circ} - 5d^3 D^{\dagger}$ (27)
Air 2929.37 2660.49	E E	30 60	5.68 5.68	9.90 10.32	2-2 2-1	$5s^1 D - 5p^3 P^{\circ}$ (11)	2429.65 2364.01 2390.58	E E E	35u 30u 25u	10.67 10.52 11.15	15.75 15.74 16.31	3-4 2-3 1-2	$5p^3 D^{\circ} - 5d^3 F^{\dagger}$ (28)
2767.54 2447.93	E E	75 80	5.68 5.68	10.14 10.73	2-3 2-2	$5s^1 D - 5p^3 F^{\circ}$ (12)	*2145.76 2411.59	A D	20u 20	10.52 11.15	16.27 16.27	2-2 1-2	$5p^3 D^{\circ} - 5d^1 D$ (29)
2473.84	E	80	5.68	10.67	2-3	$5s^1 D - 5p^3 D^{\circ\dagger}$ (13)							
2320.29	E	80R	5.68	11.00	2-3	$5s^1 D - 5p^1 F^{\circ}$ (14)	2756.48	E	35u	11.00	15.48	3-2	$5p^1 F^{\circ} - 6s^1 D$ (30)
2280.03	E	75	5.68	11.10	2-1	$5s^1 D - 5p^1 P^{\circ}$ (15)	2358.87	E	35u	11.00	16.23	3-4	$5p^1 F^{\circ} - 5d^1 G$ (31)
2229.53	A	60	5.68	11.22	2-2	$5s^1 D - 5p^1 D^{\circ}$ (16)	2815.57	E	20u	11.10	15.48	1-2	$5p^1 P^{\circ} - 6s^1 D$ (32)

Ag II—Continued

Ag II—Continued

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Air 2711.21	E	15u	11.10	15.65	1-1	5p $^1P^\circ - 5d \ ^3P^\dagger$ (33)	Air 2444.22	E	25u	11.22	16.27	2-2	5p $^1D^\circ - 5d \ ^1D$ (37)
2243.44	D	40	11.10	16.60	1-0	5p $^1P^\circ - 5d \ ^1S$ (34)	2420.11	E	30u	11.22	16.32	2-3	5p $^1D^\circ - 5d \ ^1F$ (38)
2920.07	E	15u	11.22	15.45	2-1	5p $^1D^\circ - 6s \ ^3D^\dagger$ (35)	2596.84	C	15	11.60	16.35	4-4	5s ² $^3F - 6p \ ^3F^\circ^\dagger$ (39)
2896.50	E	20u	11.22	15.48	2-2	5p $^1D^\circ - 6s \ ^1D$ (36)	2878.79	E	15	12.09	16.38	3-4	5s ² $^3F - 1^\circ$ (40)

Ag III

I P 36.0 Anal B List C April 1953

REFERENCE

A W. P. Gilbert, Phys. Rev. 48, 338 (1935). W L, I, T, I P

Ag III

Ag III

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Vac 808.88	A	30	0.00	15.26	2½-3½	4d ⁹ $^2D - 5p \ ^4F^\circ^\dagger$	Air 2161.89	A	60	8.85	14.56	3½-4½	5s $^2F - 5p \ ^4G^\circ^\dagger$
822.39	A	18	0.57	15.58	1½-2½	(1)	2056.99	A	20	9.13	15.13	2½-2½	(9)
792.35	A	25	0.00	15.58	2½-2½		Vac 1966.89	A	40	8.85	15.13	3½-2½	
838.11	A	20	0.57	15.30	1½-1½								
799.41	A	40	0.00	15.44	2½-2½	4d ⁹ $^2D - 5p \ ^2D^\circ^\dagger$	*1975.92	A	60	8.85	15.10	3½-4½	5s $^2F - 5p \ ^4F^\circ^\dagger$
829.98	A	8	0.57	15.44	1½-2½	(2)	Air 2011.49	A	20	9.13	15.26	2½-3½	(10)
789.08	A	20	0.00	15.65	2½-3½	4d ⁹ $^2D - 5p \ ^2F^\circ^\dagger$	Vac 1925.30	A	20	8.85	15.26	3½-3½	
776.38	A	35	0.00	15.90	2½-2½	(3)	2000.24	A	60	9.13	15.30	2½-1½	
730.04	A	35	0.00	16.91	2½-3½	4d ⁹ $^2D - 5p' \ ^4D^\circ^\dagger$	1867.12	A	35	8.85	15.46	3½-4½	5s $^2F - 5p \ ^2G^\circ^\dagger$
755.73	A	15	0.57	16.90	1½-2½	(4)	1858.91	A	12	9.13	15.77	2½-3½	(11)
709.80	A	20	0.00	17.39	2½-3½	4d ⁹ $^2D - 5p''' \ ^2F^\circ$							
726.96	A	30	0.57	17.55	1½-2½	(5)							
1917.08	A	60	7.81	14.25	4½-3½	5s $^4F - 5p \ ^4D^\circ^\dagger$	Air 2562.87	A	10	9.43	14.25	2½-3½	5s' $^4P - 5p \ ^4D^\circ^\dagger$
1873.45	A	40	8.12	14.71	3½-2½	(6)	2395.69	A	30	9.56	14.71	1½-2½	(12)
1856.33	A	15	8.41	15.06	2½-1½								
1849.93	A	12	8.56	15.23	1½-0½								
1751.03	A	75	7.81	14.86	4½-5½	5s $^4F - 5p \ ^4G^\circ^\dagger$	Vac 1977.03	A	50	10.52	16.76	1½-2½	5s' $^2P - 5p'' \ ^2D^\circ^\dagger$
1916.92	A	40	8.12	14.56	3½-4½	(7)							(13)
1889.57	A	30	8.41	14.95	2½-3½								
1880.36	A	25	8.56	15.13	1½-2½								
1828.83	A	35	7.81	14.56	4½-4½								
1808.23	A	30	8.12	14.95	3½-3½		1840.14	A	40	10.57	17.28	4½-5½	5s''' $^2G - 5p''' \ ^2H^\circ^\dagger$
1838.64	A	15	8.41	15.13	2½-2½		1957.62	A	70	10.58	16.89	3½-4½	(14)
1693.51	A	50	7.81	15.10	4½-4½	5s $^4F - 5p \ ^4F^\circ^\dagger$							
1728.14	A	25	8.12	15.26	3½-3½	(8)							
1722.27	A	20	8.41	15.58	2½-2½								
*1832.33	A	25	8.56	15.30	1½-1½								
1768.70	A	15	8.12	15.10	3½-4½								
1802.24	A	15	8.41	15.26	2½-3½								

CADMIUM, $Z = 48$

Cd I

I P 8.955 Anal A List C June 1953

REFERENCES

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 D C. W. Hetzler, R. W. Boreman, and K. Burns, Phys. Rev. **48**, 656 (1935). W L

Cd I

Cd I

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Air 2288.018†	D	10R	0.00	5.39	0-1	$5s^2 \ ^1S - 5p \ ^1P^\circ$ (1)	Air 2868.26 2775.047 2733.88	A D A	6r 6r 4r	3.93 3.78 3.72	8.23 8.23 8.23	2-1 1-1 0-1	$5p \ ^3P^\circ - 8s \ ^3S$ (7)
Vac 1710.51	A	3	0.00	7.22	0-1	$5s^2 \ ^1S - 6p \ ^2P^\circ$ (2)	2763.89 *2677.64	A A	6R 8d	3.93 3.78	8.39 8.39	2-3 1-2	$5p \ ^3P^\circ - 7d \ ^3D$ (8)
1669.29	A	10	0.00	7.40	0-1	$5s^2 \ ^1S - 6p \ ^1P^\circ$ (3)	2639.50 2764.19 *2677.64	A A A	6R 2R 8d	3.72 3.93 3.78	8.39 8.39 8.39	0-1 2-2 1-1	
1526.85	A	8	0.00	8.09	0-1	$5s^2 \ ^1S - 7p \ ^1P^\circ$ (4)	2712.40 2629.06 2592.14	A A A	6r 4r 2r	3.93 3.78 3.72	8.48 8.48 8.48	2-1 1-1 0-1	$5p \ ^3P^\circ - 9s \ ^3S$ (9)
1469.39	A	6	0.00	8.40	0-1	$5s^2 \ ^1S - 8p \ ^1P^\circ$ (5)	2660.40 2580.27 2544.72	A A A	4r 2n 2n	3.93 3.78 3.72	8.57 8.57 8.57	2-3 1-2 0-1	$5p \ ^3P^\circ - 8d \ ^3D$ (10)
Air 2980.6216	C	8R	3.93	8.07	2-3	$5p \ ^3P^\circ - 6d \ ^3D$ (6)	2632.25	A	2r	3.93	8.62	2-1	$5p \ ^3P^\circ - 10s \ ^3S$
2880.77	A	8R	3.78	8.07	1-2		2553.53	A	—	3.78	8.62	1-1	(11)
2836.90	A	8R	3.72	8.07	0-1		2518.70	A	—	3.72	8.62	0-1	
2981.34	A	4R	3.93	8.07	2-2		2267.46	B	5R	3.78	9.23	1-1	$5p \ ^3P^\circ - 5p^2 \ ^3P$
2881.23	A	4R	3.78	8.07	1-1		2329.27	B	10R	3.93	9.23	2-1	(12)
2981.89	A	1	3.93	8.07	2-1		2306.61 2239.86	B B	5R 5R	3.78 3.72	9.13 9.23	1-0 0-1	

Cd II

I P 16.835 Anal A List C February 1953

REFERENCE

- A A. G. Shenstone and J. T. Pittenger, J. Opt. Soc. Am. **39**, 220 (1949). W L, I, T, I P

Cd II

Cd II

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Air 2144.408† 2265.018	A A	1000R 1000	0.00 0.00	5.76 5.45	$0\frac{1}{2} - 1\frac{1}{2}$ $0\frac{1}{2} - 0\frac{1}{2}$	$5s \ ^2S - 5p \ ^2P^\circ$ (1)	Vac 860.38 847.52	A A	30 25	0.00 0.00	14.35 14.57	$0\frac{1}{2} - 1\frac{1}{2}$ $0\frac{1}{2} - 0\frac{1}{2}$	$5s \ ^2S - 5p' \ ^4D^\circ$ (4)
Vac 1048.38 1055.83	A A	40 25	0.00 0.00	11.78 11.69	$0\frac{1}{2} - 1\frac{1}{2}$ $0\frac{1}{2} - 0\frac{1}{2}$	$5s \ ^2S - 6p \ ^2P^\circ$ (2)	839.94 838.26	A A	30 30	0.00 0.00	14.70 14.73	$0\frac{1}{2} - 1\frac{1}{2}$ $0\frac{1}{2} - 0\frac{1}{2}$	$5s \ ^2S - 5p' \ ^2P^\circ$ (5)
913.72 891.28	A A	20 25	0.00 0.00	13.51 13.85	$0\frac{1}{2} - 1\frac{1}{2}$ $0\frac{1}{2} - 0\frac{1}{2}$	$5s \ ^2S - 5p' \ ^4P^\circ$ (3)	Air 2748.549 2572.930	A A	1000 500	5.76 5.45	10.25 10.25	$1\frac{1}{2} - 0\frac{1}{2}$ $0\frac{1}{2} - 0\frac{1}{2}$	$5p \ ^2P^\circ - 6s \ ^2S$ (6)

Cd II—Continued

Cd II—Continued

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Air							Air						
2312.766	A	1000	5.76	11.09	$1\frac{1}{2}-2\frac{1}{2}$	$5p\ ^2P^\circ - 5d\ ^2D$	2032.44	A	50	8.55	14.62	$2\frac{1}{2}-3\frac{1}{2}$	$5s^2\ ^2D - 5f\ ^2F^\circ$
2194.557	A	1000	5.45	11.07	$0\frac{1}{2}-1\frac{1}{2}$	(7)	2290.110	A	20	9.25	14.63	$1\frac{1}{2}-2\frac{1}{2}$	(17)
2321.074	A	200	5.76	11.07	$1\frac{1}{2}-1\frac{1}{2}$		2028.26	A	20	8.55	14.63	$2\frac{1}{2}-2\frac{1}{2}$	
Vac							2007.49	A	100	8.55	14.70	$2\frac{1}{2}-1\frac{1}{2}$	$5s^2\ ^2D - 5p'\ ^2P^\circ\uparrow$
1647.93	A	60	5.76	13.25	$1\frac{1}{2}-0\frac{1}{2}$	$5p\ ^2P^\circ - 7s\ ^2S$							(18)
1583.17	A	50	5.45	13.25	$0\frac{1}{2}-0\frac{1}{2}$	(8)	Vac						
							1922.23	A	300	8.55	14.97	$2\frac{1}{2}-2\frac{1}{2}$	$5s^2\ ^2D - 5p'\ ^2D^\circ$
1571.58	A	200	5.76	13.61	$1\frac{1}{2}-2\frac{1}{2}$	$5p\ ^2P^\circ - 6d\ ^2D$	Air						(19)
1514.26	A	200	5.45	13.60	$0\frac{1}{2}-1\frac{1}{2}$	(9)	2209.653	A	20	9.25	14.83	$1\frac{1}{2}-1\frac{1}{2}$	
1573.42	A	50	5.76	13.60	$1\frac{1}{2}-1\frac{1}{2}$		Vac						
							1965.54	A	40	8.55	14.83	$2\frac{1}{2}-1\frac{1}{2}$	
1404.11	A	75	5.76	14.57	$1\frac{1}{2}-0\frac{1}{2}$	$5p\ ^2P^\circ - 8s\ ^2S$	Air						
1353.08	A	40	5.45	14.57	$0\frac{1}{2}-0\frac{1}{2}$	(10)	2155.062	A	50	9.25	14.97	$1\frac{1}{2}-2\frac{1}{2}$	
1370.91	A	150	5.76	14.76	$1\frac{1}{2}-2\frac{1}{2}$	$5p\ ^2P^\circ - 7d\ ^2D$	Vac						
1326.50	A	100	5.45	14.76	$0\frac{1}{2}-1\frac{1}{2}$	(11)	1943.54	A	100	8.55	14.90	$2\frac{1}{2}-1\frac{1}{2}$	$5s^2\ ^2D - 8p\ ^2P^\circ\uparrow$
1371.65	A	50	5.76	14.76	$1\frac{1}{2}-1\frac{1}{2}$		Air						(20)
							2186.300	A	15	9.25	14.89	$1\frac{1}{2}-0\frac{1}{2}$	
1296.43	A	150	5.76	15.28	$1\frac{1}{2}-0\frac{1}{2}$	$5p\ ^2P^\circ - 9s\ ^2S$	Vac						
1256.00	A	100	5.45	15.28	$0\frac{1}{2}-0\frac{1}{2}$	(12)	1827.70	A	100	8.55	15.30	$2\frac{1}{2}-3\frac{1}{2}$	$5s^2\ ^2D - 6f\ ^2F^\circ\uparrow$
Air							Air						(21)
2551.976	A	50	8.55	13.39	$2\frac{1}{2}-3\frac{1}{2}$	$5s^2\ ^2D - 4f\ ^2F^\circ$	2036.22	A	75	9.25	15.31	$1\frac{1}{2}-2\frac{1}{2}$	
2552.827	A	15	8.55	13.38	$2\frac{1}{2}-2\frac{1}{2}$	(13)	Vac						
							1785.84	A	100	8.55	15.46	$2\frac{1}{2}-1\frac{1}{2}$	$5s^2\ ^2D - 9p\ ^2P^\circ\uparrow$
2469.733	A	50	8.55	13.55	$2\frac{1}{2}-3\frac{1}{2}$	$5s^2\ ^2D - 5p'\ ^4F^\circ\uparrow$	1986.89	A	30	9.25	15.46	$1\frac{1}{2}-0\frac{1}{2}$	(22)
2834.081	A	20	9.25	13.60	$1\frac{1}{2}-2\frac{1}{2}$	(14)							
							1668.60	A	100	8.55	15.95	$2\frac{1}{2}-3\frac{1}{2}$	$5s^2\ ^2D - 5p''\ ^2F^\circ$
2495.584	A	40	9.25	14.19	$1\frac{1}{2}-2\frac{1}{2}$	$5s^2\ ^2D - 5p'\ ^4D^\circ$	1759.78	A	20	9.25	16.26	$1\frac{1}{2}-2\frac{1}{2}$	(23)
2187.794	A	100	8.55	14.19	$2\frac{1}{2}-2\frac{1}{2}$	(15)	1601.04	A	50	8.55	16.26	$2\frac{1}{2}-2\frac{1}{2}$	
2418.694	A	50	9.25	14.35	$1\frac{1}{2}-1\frac{1}{2}$								
Vac													
1995.43	A	200	8.55	14.74	$2\frac{1}{2}-3\frac{1}{2}$	$5s^2\ ^2D - 5p'\ ^2F^\circ$	Air						
						(16)	2929.271	A	200	11.09	15.30	$2\frac{1}{2}-3\frac{1}{2}$	$5d\ ^2D - 6f\ ^2F^\circ$
Air							2914.672	A	200	11.07	15.31	$1\frac{1}{2}-2\frac{1}{2}$	(24)
2376.820	A	40	9.25	14.44	$1\frac{1}{2}-2\frac{1}{2}$		2927.867	A	50	11.09	15.31	$2\frac{1}{2}-2\frac{1}{2}$	
2096.00	A	150	8.55	14.44	$2\frac{1}{2}-2\frac{1}{2}$								

Cd III

I P 37.32 Anal B List B January 1961

REFERENCE

A A. G. Shenstone and J. T. Pittenger, J. Opt. Soc. Am. **39**, 219 (1949). I P, T, C L, W L, I

Cd III

Cd III

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Vac							Vac						
720.70	A	10	0.00	17.13	0-1	$4d\ ^1S - 5p\ ^3P^\circ$	1601.59	A	40	9.93	17.64	3-3	$5s\ ^3D - 5p\ ^3D^\circ\uparrow$
						(1)	1721.93	A	40	10.17	17.34	2-2	(6)
677.39	A	8	0.00	18.22	0-1	$4d\ ^1S - 5p\ ^3D^\circ$	1628.54	A	25	10.64	18.22	1-1	
						(2)	1651.87	A	20	10.17	17.64	2-3	
684.58	A	15	0.00	18.03	0-1	$4d\ ^1S - 5p\ ^1P^\circ$	1844.66	A	50	10.64	17.34	1-2	
						(3)							
							Air						
1874.08	A	150	9.93	16.52	3-2	$5s\ ^3D - 5p\ ^3P^\circ\uparrow$	2111.60	A	50	10.97	16.82	2-3	$5s\ ^1D - 5p\ ^3F^\circ$
1773.06	A	40	10.17	17.13	2-1	(4)	Vac						(7)
1789.19	A	30	10.64	17.54	1-0		1855.85	A	40	10.97	17.62	2-2	
1707.16	A	40	9.93	17.16	3-4	$5s\ ^3D - 5p\ ^3F^\circ$	1851.13	A	40	10.97	17.64	2-3	$5s\ ^1D - 5p\ ^3D^\circ\uparrow$
1856.67	A	200	10.17	16.82	2-3	(5)							(8)
1768.82	A	30	10.64	17.62	1-2		1747.67	A	40	10.97	18.03	2-3	$5s\ ^1D - 5p\ ^1F^\circ$
1793.40	A	75	9.93	16.82	3-3								(9)
1655.63	A	25	10.17	17.62	2-2								

Cd iv

I P Anal B List C February 1956

REFERENCE

A M. Green, Phys. Rev. **60**, 117 (1941). W L, I, T

Cd IV

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Vac													
546.53	A	25	0.00	22.59	$2\frac{1}{2}-3\frac{1}{2}$	$4d^9\ ^2D - 5p\ ^4F^\circ$	Vac						
554.04	A	18	0.72	23.00	$1\frac{1}{2}-2\frac{1}{2}$	(1)	506.31	A	19	0.00	24.38	$2\frac{1}{2}-3\frac{1}{2}$	$4d^9\ ^2D - 5p'\ ^4D^\circ$
536.75	A	17	0.00	23.00	$2\frac{1}{2}-2\frac{1}{2}$		519.41	A	14	0.72	24.48	$1\frac{1}{2}-2\frac{1}{2}$	(7)
567.03	A	18	0.72	22.49	$1\frac{1}{2}-1\frac{1}{2}$		504.19	A	11	0.00	24.48	$2\frac{1}{2}-2\frac{1}{2}$	
548.92	A	10	0.00	22.49	$2\frac{1}{2}-1\frac{1}{2}$		504.49	A	17	0.00	24.47	$2\frac{1}{2}-1\frac{1}{2}$	
							493.00	A	17	0.00	25.04	$2\frac{1}{2}-3\frac{1}{2}$	$4d^9\ ^2D - 5p'''\ ^2F^\circ\uparrow$
542.59	A	25	0.00	22.75	$2\frac{1}{2}-2\frac{1}{2}$	$4d^9\ ^2D - 5p\ ^2D^\circ$	504.09	A	14	0.72	25.21	$1\frac{1}{2}-2\frac{1}{2}$	(8)
551.26	A	11	0.72	23.11	$1\frac{1}{2}-1\frac{1}{2}$	(2)							
560.25	A	14	0.72	22.75	$1\frac{1}{2}-2\frac{1}{2}$								
531.50	A	18	0.00	23.23	$2\frac{1}{2}-3\frac{1}{2}$	$4d^9\ ^2D - 5p\ ^2G^\circ$	1418.89	A	16	13.42	22.12	$4\frac{1}{2}-5\frac{1}{2}$	$5s\ ^4F - 5p\ ^4G^\circ\uparrow$
						(3)	1572.69	A	6	13.79	21.64	$3\frac{1}{2}-4\frac{1}{2}$	(9)
534.28	A	17	0.00	23.11	$2\frac{1}{2}-3\frac{1}{2}$	$4d^9\ ^2D - 5p\ ^2F^\circ$	1547.62	A	6	14.17	22.14	$2\frac{1}{2}-3\frac{1}{2}$	
548.00	A	11	0.72	23.25	$1\frac{1}{2}-2\frac{1}{2}$	(4)	1545.79	A	6	14.34	22.32	$1\frac{1}{2}-2\frac{1}{2}$	
531.08	A	18	0.00	23.25	$2\frac{1}{2}-2\frac{1}{2}$								
							1370.48	A	16	13.42	22.43	$4\frac{1}{2}-4\frac{1}{2}$	$5s\ ^4F - 5p\ ^4F^\circ\uparrow$
524.40	A	14	0.00	23.54	$2\frac{1}{2}-2\frac{1}{2}$	$4d^9\ ^2D - 5p'\ ^4P^\circ\uparrow$	1403.68	A	12	13.79	22.59	$3\frac{1}{2}-3\frac{1}{2}$	(10)
541.73	A	18	0.72	23.51	$1\frac{1}{2}-1\frac{1}{2}$	(5)	1397.65	A	10	14.17	23.00	$2\frac{1}{2}-2\frac{1}{2}$	
525.18	A	14	0.00	23.51	$2\frac{1}{2}-1\frac{1}{2}$		1513.92	A	6	14.34	22.49	$1\frac{1}{2}-1\frac{1}{2}$	
514.49	A	17	0.00	23.99	$2\frac{1}{2}-3\frac{1}{2}$	$4d^9\ ^2D - 5p''\ ^2F^\circ\uparrow$							
537.22	A	14	0.72	23.70	$1\frac{1}{2}-2\frac{1}{2}$	(6)							

INDIUM, $Z = 49$

In I

I P 5.761 Anal A List C September 1961

REFERENCES

- A F. Paschen, *Ann. der Phys.* [5] **32**, 148 (1938). W L, T, I P
 B F. Paschen, Wavelength from center of gravity of hfs components, See reference A. (W L)
 C H. S. Uhler and J. W. Tanch, *Astroph. J.* **55**, 291 (1922). W L, (I)
 D W. R. S. Garton and K. Codling, *Proc. Phys. Soc.*, **78**, 600 (1961). W L
 W. F. Meggers, C. H. Corliss, and B. F. Scribner, *Nat. Bur. Std. Monograph* **32**, Part I, 136 (1962). I

In I

In I

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Air							Air						
2836.905	B	18	0.27	4.62	$1\frac{1}{2}-2\frac{1}{2}$	$5p\ ^2P^\circ - 5p^2\ ^4P$ (1)	2601.756	C	20	0.27	5.02	$1\frac{1}{2}-0\frac{1}{2}$	$5p\ ^2P^\circ - 8s\ ^2S$ (4)
2775.358	B	4	0.00	4.45	$0\frac{1}{2}-1\frac{1}{2}$		2460.079	C	6	0.00	5.02	$0\frac{1}{2}-0\frac{1}{2}$	
2956.997	B	2	0.27	4.45	$1\frac{1}{2}-1\frac{1}{2}$		2521.371	C	10	0.27	5.17	$1\frac{1}{2}-2\frac{1}{2}$	
2858.133	B	3	0.00	4.32	$0\frac{1}{2}-0\frac{1}{2}$		2389.556	D	2	0.00	5.16	$0\frac{1}{2}-1\frac{1}{2}$	
3051.142	B	—	0.27	4.32	$1\frac{1}{2}-0\frac{1}{2}$		2522.985	A	—	0.27	5.16	$1\frac{1}{2}-1\frac{1}{2}$	
2932.630	A	110	0.27	4.48	$1\frac{1}{2}-0\frac{1}{2}$	$5p\ ^2P^\circ - 7s\ ^2S$ (2)	2468.023	A	30	0.27	5.27	$1\frac{1}{2}-0\frac{1}{2}$	$5p\ ^2P^\circ - 9s\ ^2S$ (6)
2753.878	A	70	0.00	4.48	$0\frac{1}{2}-0\frac{1}{2}$		2340.199	D	(3)	0.00	5.27	$0\frac{1}{2}-0\frac{1}{2}$	
2710.265	A	160	0.27	4.83	$1\frac{1}{2}-2\frac{1}{2}$	$5p\ ^2P^\circ - 6d\ ^2D$ (3)	2399.175	D	(3)	0.27	5.42	$1\frac{1}{2}-0\frac{1}{2}$	$5p\ ^2P^\circ - 10s\ ^2S$ (7)
2560.150	A	110	0.00	4.82	$0\frac{1}{2}-1\frac{1}{2}$		2278.196	D	(2)	0.00	5.42	$0\frac{1}{2}-0\frac{1}{2}$	
2713.936	A	30	0.27	4.82	$1\frac{1}{2}-1\frac{1}{2}$								

In II

I P 18.79 Anal A List D August 1953

REFERENCES

- A R. J. Lang and R. A. Sawyer, Zeit. Phys. **71**, 456 (1931). W L, I, T
 B F. Paschen und J. S. Campbell, Ann. der Phys. [5] **31**, 48 (1938). W L, (I), T, I P
 (Wavelengths represent the center of gravity of the hfs components for complex lines).

In II

In II

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Air 2306.049	B	10	0.00	5.35	0-1	$5s^2 \ ^1S - 5p \ ^3P^\circ$ (1)	Vac 1770.83 1700.01 1774.79 1702.51	A A A A	6 6 5 6	5.66 5.35 5.66 5.35	12.63 12.61 12.61 12.60	2-3 1-2 2-2 1-1	$5p \ ^3P^\circ - 5d \ ^3D^\dagger$ (6)
Vac 1586.37†	A	6	0.00	7.78	0-1	$5s^2 \ ^1S - 5p \ ^1P^\circ$ (2)	1280.49	A	10	5.35	14.99	1-1	$5p \ ^3P^\circ - 7s \ ^3S^\dagger$ (7)
Air 2079.26	A	25	5.66	11.59	2-1	$5p \ ^3P^\circ - 6s \ ^3S$ (3)	Air 2941.050	B	8	7.78	11.98	1-0	$5p \ ^1P^\circ - 6s \ ^1S$ (8)
Vac 1977.45	A	20	5.35	11.59	1-1								
1936.25	A	10	5.22	11.59	0-1		2890.180	B	20	7.78	12.05	1-2	$5p \ ^1P^\circ - 5p^2 \ ^1D$ (9)
1930.52	A	8	5.66	12.05	2-2	$5p \ ^3P^\circ - 5p^2 \ ^1D$ (4)	Vac 1966.88	A	10	7.78	15.64	1-2	$5p \ ^1P^\circ - 6d \ ^1D$ (10)
1674.04	A	6	5.66	13.03	2-2	$5p \ ^3P^\circ - 5p^2 \ ^3P^\dagger$ (5)							
1669.51	A	4	5.35	12.75	1-1								
1741.59	A	5	5.66	12.75	2-1								
1716.74	A	8	5.35	12.54	1-0		Air 2749.748	B	6	12.05	16.54	2-3	$5p^2 \ ^1D - 5f \ ^1F^\circ$ (11)

In III

I P 27.92 Anal C List B January 1956

REFERENCE

A R. Nodwell, unpublished material (December 1955). W L, I, T, I P

In III

In III

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Vac 1625.42 1748.83	A A	100 100	0.00 0.00	7.60 7.06	$0\frac{1}{2}-1\frac{1}{2}$ $0\frac{1}{2}-0\frac{1}{2}$	$5s\ ^2S - 5p\ ^2P^\circ$ (1)	Air 2154.08 2527.41 2154.42	A A A	30 100 2	14.27 15.11 14.27	20.00 20.00 20.00	$2\frac{1}{2}-3\frac{1}{2}$ $1\frac{1}{2}-2\frac{1}{2}$ $2\frac{1}{2}-2\frac{1}{2}$	$5s^2\ ^2D - 4f\ ^2F^\circ$ (8)
685.31 691.62	A A	7 5	0.00 0.00	18.01 17.85	$0\frac{1}{2}-1\frac{1}{2}$ $0\frac{1}{2}-0\frac{1}{2}$	$5s\ ^2S - 6p\ ^2P^\circ$ (2)							
							Vac 1842.41 1862.98	A A	30 15	15.66 15.66	22.36 22.29	$0\frac{1}{2}-1\frac{1}{2}$ $0\frac{1}{2}-0\frac{1}{2}$	$6s\ ^2S - 7p\ ^2P^\circ?$ (9)
1850.30 1532.95 1642.28	A A A	40 30 20	7.60 7.06 7.60	14.27 15.11 15.11	$1\frac{1}{2}-2\frac{1}{2}$ $0\frac{1}{2}-1\frac{1}{2}$ $1\frac{1}{2}-1\frac{1}{2}$	$5p\ ^2P^\circ - 5s^2\ ^2D$ (3)							
1530.21 1434.85	A A	20 30	7.60 7.06	15.66 15.66	$1\frac{1}{2}-0\frac{1}{2}$ $0\frac{1}{2}-0\frac{1}{2}$	$5p\ ^2P^\circ - 6s\ ^2S$ (4)	Air 3008.08 2982.80 3008.82	A A A	100 100 30	15.89 15.86 15.89	20.00 20.00 20.00	$2\frac{1}{2}-3\frac{1}{2}$ $1\frac{1}{2}-2\frac{1}{2}$ $2\frac{1}{2}-2\frac{1}{2}$	$5d\ ^2D - 4f\ ^2F^\circ$ (10)
1487.70 1403.08 1494.14	A A A	20 30 20	7.60 7.06 7.60	15.89 15.86 15.86	$1\frac{1}{2}-2\frac{1}{2}$ $0\frac{1}{2}-1\frac{1}{2}$ $1\frac{1}{2}-1\frac{1}{2}$	$5p\ ^2P^\circ - 5d\ ^2D$ (5)							
926.83 890.84	A A	5 10	7.60 7.06	20.92 20.92	$1\frac{1}{2}-0\frac{1}{2}$ $0\frac{1}{2}-0\frac{1}{2}$	$5p\ ^2P^\circ - 7s\ ^2S$ (6)	2300.90 2232.18	A A	10 5	18.01 17.85	23.38 23.38	$1\frac{1}{2}-0\frac{1}{2}$ $0\frac{1}{2}-0\frac{1}{2}$	$6p\ ^2P^\circ - 8s\ ^2S$ (11)
915.87 882.24 917.45	A A A	10 10 2	7.60 7.06 7.60	21.07 21.05 21.05	$1\frac{1}{2}-2\frac{1}{2}$ $0\frac{1}{2}-1\frac{1}{2}$ $1\frac{1}{2}-1\frac{1}{2}$	$5p\ ^2P^\circ - 6d\ ^2D$ (7)	2261.26 2199.52 2266.26	A A A	20 10 5	18.01 17.85 18.01	23.47 23.46 23.46	$1\frac{1}{2}-2\frac{1}{2}$ $0\frac{1}{2}-1\frac{1}{2}$ $1\frac{1}{2}-1\frac{1}{2}$	$6p\ ^2P^\circ - 7d\ ^2D$ (12)
							2726.15 2725.52	A A	80 50	20.00 20.00	24.52 24.52	$3\frac{1}{2}-$ $2\frac{1}{2}-3\frac{1}{2}$	$4f\ ^2F^\circ - 6g\ ^2G$ (13)

TIN, $Z = 50$

Sn I

I P 7.303 Anal A List C June 1956

REFERENCES

- A W. F. Meggers, J. Research Nat. Bur. Std. **24**, 153, RP1275 (1940). W L, I, T, I P
 B A. G. Shenstone, unpublished material (June 1956). W L, (I)

Sn I

Sn I

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Air							Vac						
2839.99	A	700R	0.42	4.77	2-2	$5p^2\ ^3P - 6s\ ^3P^\circ$	1891.40	A	100rl	0.42	6.85	2-3	$5p^2\ ^3P - 6d\ ^1F^\circ$
3009.136	A	700R	0.21	4.31	1-1	(1)							(9)
3175.046†	A	2000R	0.42	4.31	2-1								
3034.120	A	900R	0.21	4.28	1-0								
2706.510	A	1000R	0.21	4.77	1-2								
2863.324	A	600R	0.00	4.31	0-1								
							Air						
2661.243	A	200R	0.21	4.85	1-1	$5p^2\ ^3P - 6s\ ^1P^\circ$	2571.576	A	500R	1.06	5.86	2-3	$5p^2\ ^1D - 5d\ ^3F^\circ$
2546.549	A	400r	0.00	4.85	0-1	(2)	2850.62	A	200r	1.06	5.39	2-2	(10)
2268.913	A	400R	0.42	5.86	2-3	$5p^2\ ^3P - 5d\ ^3F^\circ$	2779.810	A	150	1.06	5.50	2-3	$5p^2\ ^1D - 5d\ ^3D^\circ$
2380.72	A	60	0.21	5.39	1-2	(3)	2813.575	A	80	1.06	5.45	2-2	(11)
2483.392	A	300r	0.42	5.39	2-2		2785.030	A	80	1.06	5.49	2-1	
2429.488	A	1000R	0.42	5.50	2-3	$5p^2\ ^3P - 5d\ ^3D^\circ$	2594.424	A	200r	1.06	5.82	2-2	$5p^2\ ^1D - 5d\ ^1D^\circ$
2354.837	A	1000R	0.21	5.45	1-2	(4)							(12)
2246.048	A	400R	0.00	5.49	0-1		2523.915	A	90r	1.06	5.95	2-1	$5p^2\ ^1D - 7s\ ^3P^\circ$
2455.235	A	60	0.42	5.45	2-2								(13)
2334.80	A	300R	0.21	5.49	1-1		2495.704	A	200r	1.06	6.01	2-2	$5p^2\ ^1D - 5d\ ^3P^\circ$
2433.467	A	15	0.42	5.49	2-1								(14)
2286.681	A	200R	0.42	5.82	2-2	$5p^2\ ^3P - 5d\ ^1D^\circ$	2421.697	A	800R	1.06	6.16	2-3	$5p^2\ ^1D - 5d\ ^1F^\circ$
2199.337	A	300R	0.21	5.82	1-2	(5)							(15)
2040.660	A	50	0.42	6.47	2-2	$5p^2\ ^3P - 7s\ ^3P^\circ$	2408.15	A	100	1.06	6.19	2-1	$5p^2\ ^1D - 5d\ ^1P^\circ$
2231.725	A	80R	0.42	5.95	2-1	(6)							(16)
2148.733	A	40Rs	0.21	5.95	1-0								
Vac													
1971.452	B	(100r)	0.21	6.47	1-2		2317.23	A	600R	1.06	6.39	2-3	$5p^2\ ^1D - 6d\ ^3D^\circ$
Air													(17)
2073.08	A	100r	0.00	5.95	0-1		2096.39	A	200rl	1.06	6.95	2-3	$5p^2\ ^1D - 6d\ ^1F^\circ$
													(18)
2209.650	A	400R	0.42	6.01	2-2	$5p^2\ ^3P - 5d\ ^3P^\circ$	2072.89	A	100	1.06	7.02	2-3	$5p^2\ ^1D - 7d\ ^1F^\circ$
2113.93	A	100R	0.21	6.05	1-1	(7)							(19)
2194.494	A	150R	0.42	6.05	2-1								
Vac													
1952.141	B	(500h)	0.42	6.75	2-2	$5p^2\ ^3P - 6d\ ^3P^\circ$	2913.543	A	200h	2.12	6.35	0-1	$5p^2\ ^1S - 6d\ ^3D^\circ$
1848.768	B	(100R)	0.21	6.89	1-0	(8)							(20)
1815.771	B	(100R)	0.00	6.80	0-1								

Sn II

I P 14.57 Anal B List C January 1961

REFERENCES

- A A. G. Shenstone, unpublished material (June 1955). I P, T, C L, W L, I
 B See W. W. McCormick and R. A. Sawyer, Phys. Rev. **54**, 71 (1938). W L, (I), T, I P

Sn II

Sn II

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Vac							Vac						
1899.890	A	5000	0.52	7.02	$1\frac{1}{2}-0\frac{1}{2}$	$5p\ ^2P^\circ - 6s\ ^2S$	1161.412	A	500	0.52	11.15	$1\frac{1}{2}-2\frac{1}{2}$	$5p\ ^2P^\circ - 6d\ ^2D$
1757.904	A	5000	0.00	7.02	$0\frac{1}{2}-0\frac{1}{2}$	(1)	1108.128	A	500H	0.00	11.14	$0\frac{1}{2}-1\frac{1}{2}$	(6)
							1162.920	A	200	0.52	11.14	$1\frac{1}{2}-1\frac{1}{2}$	
1811.200	A	1000	0.52	7.34	$1\frac{1}{2}-2\frac{1}{2}$	$5p\ ^2P^\circ - 5p^2\ ^2D$							
1699.419	A	1000	0.00	7.26	$0\frac{1}{2}-1\frac{1}{2}$	(2)	1040.715	A	200H	0.52	12.39	$1\frac{1}{2}-2\frac{1}{2}$	$5p\ ^2P^\circ - 7d\ ^2D^\dagger$
1831.753	A	500	0.52	7.26	$1\frac{1}{2}-1\frac{1}{2}$		997.167	A	200H	0.00	12.38	$0\frac{1}{2}-1\frac{1}{2}$	(7)
1475.008	A	1000H	0.52	8.89	$1\frac{1}{2}-2\frac{1}{2}$	$5p\ ^2P^\circ - 5d\ ^2D$	1574.424	A	1000	6.26	14.10	$2\frac{1}{2}-2\frac{1}{2}$	$5p^2\ ^4P - 6s'\ ^4P^\dagger$
1400.454	A	1000H	0.00	8.82	$0\frac{1}{2}-1\frac{1}{2}$	(3)	1665.329	A	100h	6.26	13.68	$2\frac{1}{2}-1\frac{1}{2}$	(8)
1489.106	A	200	0.52	8.82	$1\frac{1}{2}-1\frac{1}{2}$		1517.900	A	200	5.97	14.10	$1\frac{1}{2}-2\frac{1}{2}$	
							*1554.877	A	500H	5.74	13.68	$0\frac{1}{2}-1\frac{1}{2}$	
1290.886	A	1000	0.52	10.09	$1\frac{1}{2}-1\frac{1}{2}$	$5p\ ^2P^\circ - 5p^2\ ^2P$							
1242.933	A	200	0.00	9.93	$0\frac{1}{2}-0\frac{1}{2}$	(4)	1391.100	A	100	5.97	14.85	$1\frac{1}{2}-$	$5p^2\ ^4P - 5^\circ$
1312.262	A	200	0.52	9.93	$1\frac{1}{2}-0\frac{1}{2}$		1393.516	A	200H	6.26	15.12	$2\frac{1}{2}-$	(9) 6°
1223.716	A	200	0.00	10.09	$0\frac{1}{2}-1\frac{1}{2}$		Air						
							2486.99	B	(10)	7.34	12.30	$2\frac{1}{2}-3\frac{1}{2}$	$5p^2\ ^2D - 5f\ ^2F^\circ$
1219.090	A	500	0.52	10.65	$1\frac{1}{2}-0\frac{1}{2}$	$5p\ ^2P^\circ - 7s\ ^2S$	2448.98	B	(15)	7.26	12.30	$1\frac{1}{2}-2\frac{1}{2}$	(10)
1159.010	A	200	0.00	10.65	$0\frac{1}{2}-0\frac{1}{2}$	(5)	Vac						
							1520.142	A	100H	7.26	15.39	$1\frac{1}{2}-$	$5p^2\ ^2D - 9^\circ$
													(11)

Sn III

I P 30.37 Anal B List C January 1961

REFERENCE

A A. G. Shenstone, unpublished material (June 1955). I P, T, C L, W L, I

Sn III

Sn III

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Vac							Vac						
1811.712	A	500	0.00	6.81	0-1	$5s^2\ ^1S - 5p\ ^3P^\circ$	1674.294	A	50	9.86	17.24	1-1	$5p\ ^1P^\circ - 6s\ ^3S$
						(1)							(13)
1251.384	A	2000	0.00	9.86	0-1	$5s^2\ ^1S - 5p\ ^1P^\circ$	1570.365	A	1000	9.86	17.73	1-0	$5p\ ^1P^\circ - 6s\ ^1S$
						(2)							(14)
624.164	A	20	0.00	19.78	0-1	$5s^2\ ^1S - 6p\ ^3P^\circ$	1347.652	A	1000	9.86	19.03	1-2	$5p\ ^1P^\circ - 5d\ ^1D$
						(3)							(15)
614.540	A	30	0.00	20.09	0-1	$5s^2\ ^1S - 6p\ ^1P^\circ$	910.924	A	200	9.86	23.42	1-2	$5p\ ^1P^\circ - 6d\ ^1D$
						(4)							(16)
1327.345	A	1000	7.31	16.61	2-2	$5p\ ^3P^\circ - 5p^2\ ^3P$	Air						
1334.699	A	200	6.81	16.06	1-1	(5)	2214.964	A	100	16.61	22.18	2-3	$5p^2\ ^3P - 4f\ ^1F^\circ$
1410.613	A	500	7.31	16.06	2-1								(17)
1386.737	A	1000	6.81	15.72	1-0		Vac						
1259.916	A	1000	6.81	16.61	1-2		1230.171	A	100	16.61	26.65	2-	$5p^2\ ^3P - 4^\circ$
1305.970	A	1000	6.61	16.06	0-1								(18)
1449.773	A	200	7.31	15.83	2-2	$5p\ ^3P^\circ - 5p^2\ ^1D$	1204.058	A	200	16.61	26.87	2-2	$5p^2\ ^3P - 5d'\ ^3P^\circ$
1369.712	A	200	6.81	15.83	1-2	(6)	1159.297	A	20	16.06	26.76	1-1	(19)
1243.632	A	500	7.31	17.24	2-1	$5p\ ^3P^\circ - 6s\ ^3S$	Air						
1184.254	A	1000	6.81	17.24	1-1	(7)	2896.06	A	300H	15.83	20.09	2-1	$5p^2\ ^1D - 6p\ ^1P^\circ$
1161.579	A	100	6.61	17.24	0-1								(20)
1210.575	A	2000	7.31	17.51	2-3	$5p\ ^3P^\circ - 5d\ ^3D$	Vac						
1158.333	A	1000	6.81	17.47	1-2	(8)	1955.516	A	50	15.83	22.14	2-3	$5p^2\ ^1D - 4f\ ^3F^\circ$
1139.293	A	1000	6.61	17.45	0-1								(21)
1215.105	A	100	7.31	17.47	2-2		1941.857	A	500	15.83	22.18	2-3	$5p^2\ ^1D - 4f\ ^1F^\circ$
1161.092	A	200	6.81	17.45	1-1								(22)
1218.136	A	100	7.31	17.45	2-1		Air						
1053.875	A	30	7.31	19.03	2-2	$5p\ ^3P^\circ - 5d\ ^1D$	2658.57	A	250h	17.51	22.15	3-4	$5d\ ^3D - 4f\ ^3F^\circ$
1010.918	A	50	6.81	19.03	1-2	(9)	2643.56	A	200h	17.47	22.14	2-3	(23)
							2631.79	A	150h	17.45	22.14	1-2	
784.684	A	50	7.31	23.05	2-1	$5p\ ^3P^\circ - 7s\ ^3S^\dagger$	2665.53	A	50h	17.51	22.14	3-3	
700.624	A	50	6.81	23.05	1-1	(10)	2646.10	A	50h	17.47	22.14	2-2	
775.793	A	75	7.31	23.22	2-3	$5p\ ^3P^\circ - 6d\ ^3D^\dagger$	2618.61	A	50	17.47	22.18	2-3	$5d\ ^3D - 4f\ ^1F^\circ$
753.014	A	100	6.81	23.21	1-2	(11)							(24)
Air							Vac						
2069.978	A	200	9.86	15.83	1-2	$5p\ ^1P^\circ - 5p^2\ ^1D$	1346.049	A	200	17.45	26.62	1-1	$5d\ ^3D - 3^\circ?$
						(12)							(25)

Sn IV

I P 40.56 Anal B List B February 1961

REFERENCE

A A. G. Shenstone, unpublished material (June 1955). I P, T, C L, W L, I

Sn IV

Sn IV

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Vac 1314.547 1437.519	A A	1000 1000	0.00 0.00	9.39 8.59	$0\frac{1}{2}-1\frac{1}{2}$ $0\frac{1}{2}-0\frac{1}{2}$	$5s\ ^2S - 5p\ ^2P^\circ$ (1)	Vac 1058.586	A	150	20.42	32.08	$2\frac{1}{2}-3\frac{1}{2}$	$5d\ ^2D - 5p''\ ^2F^\circ?$ (9)
1119.344 1044.487 1120.679	A A A	1000 1000 500	9.39 8.59 9.39	20.42 20.41 20.41	$1\frac{1}{2}-2\frac{1}{2}$ $0\frac{1}{2}-1\frac{1}{2}$ $1\frac{1}{2}-1\frac{1}{2}$	$5p\ ^2P^\circ - 5d\ ^2D$ (2)	1052.765	A	150	20.42	32.15	$2\frac{1}{2}-2\frac{1}{2}$	$5d\ ^2D - 5p''\ ^2D^\circ?$ (10)
1073.407 923.147	A A	1000 20	9.39 8.59	20.89 21.96	$1\frac{1}{2}-2\frac{1}{2}$ $0\frac{1}{2}-1\frac{1}{2}$	$5p\ ^2P^\circ - 5s^2\ ^2D?$ (3)	1017.216	A	150	20.42	32.56	$2\frac{1}{2}-1\frac{1}{2}$	$5d\ ^2D - 5p''\ ^2P^\circ?$ (11)
1019.719 956.249	A A	500 500	9.39 8.59	21.50 21.50	$1\frac{1}{2}-0\frac{1}{2}$ $0\frac{1}{2}-0\frac{1}{2}$	$5p\ ^2P^\circ - 6s\ ^2S$ (4)	1103.237	A	300	20.89	32.08	$2\frac{1}{2}-3\frac{1}{2}$	$5s^2\ ^2D - 5p''\ ^2F^\circ?$ (12)
628.726 605.226	A A	50 50	9.39 8.59	29.03 28.99	$1\frac{1}{2}-2\frac{1}{2}$ $0\frac{1}{2}-1\frac{1}{2}$	$5p\ ^2P^\circ - 6d\ ^2D^\dagger$ (5)	1096.916	A	500	20.89	32.15	$2\frac{1}{2}-2\frac{1}{2}$	$5s^2\ ^2D - 5p''\ ^2D^\circ?$ (13)
619.039 595.061	A A	50 30	9.39 8.59	29.33 29.33	$1\frac{1}{2}-0\frac{1}{2}$ $0\frac{1}{2}-0\frac{1}{2}$	$5p\ ^2P^\circ - 7s\ ^2S$ (6)	1058.370	A	400	20.89	32.56	$2\frac{1}{2}-1\frac{1}{2}$	$5s^2\ ^2D - 5p''\ ^2P^\circ?$ (14)
Air 2887.66 3071.69 2878.84	A A A	200H 100H 20h	20.42 20.41 20.41	24.69 24.42 24.69	$2\frac{1}{2}-1\frac{1}{2}$ $1\frac{1}{2}-0\frac{1}{2}$ $1\frac{1}{2}-1\frac{1}{2}$	$5d\ ^2D - 6p\ ^2P^\circ$ (7)	Air 2848.42 2705.92	A A	100H 30H	24.69 24.42	29.03 28.99	$1\frac{1}{2}-2\frac{1}{2}$ $0\frac{1}{2}-1\frac{1}{2}$	$6p\ ^2P^\circ - 6d\ ^2D^\dagger$ (15)
2229.127 2220.879	A A	300 200	20.42 20.41	25.96 25.96	$2\frac{1}{2}-3\frac{1}{2}$ $1\frac{1}{2}-2\frac{1}{2}$	$5d\ ^2D - 4f\ ^2F^\circ?$ (8)	2081.604 2084.212	A A	100 100	25.96 25.96	31.88 31.88	$3\frac{1}{2}-4\frac{1}{2}$ $2\frac{1}{2}-3\frac{1}{2}$	$4f\ ^2F^\circ - 5g\ ^2G$ (16)

Sn v

I P 71.97 Anal C List C February 1961

REFERENCES

A A. G. Shenstone, unpublished material (June 1955). I P, T, C L, W L, I

B R. C. Gibbs and H. E. White, Proc. Nat. Acad. Sci. 14, 345 (1928). T, C L, W L, (I)

Sn v

Sn v

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Vac 373.14	B	(10)	0.00	33.08	0-1	$4d^{10}\ ^1S - 5p\ ^3P^\circ$ (1)	Vac *1302.199 1205.723 *1302.199	A A A	100 100 100	22.54 22.85 23.60	32.02 33.08 33.08	3-2 2-1 1-1	$5s\ ^3D - 5p\ ^3P^\circ$ (4)
355.66	B	(12)	0.00	34.71	0-1	$4d^{10}\ ^1S - 5p\ ^3D^\circ$ (2)	1100.735 1294.357	A A	200 200	22.54 22.85	33.17 32.38	3-4 2-3	$5s\ ^3D - 5p\ ^3F^\circ?$ (5)
361.55	B	(15)	0.00	34.14	0-1	$4d^{10}\ ^1S - 5p\ ^1P^\circ$ (3)	1132.794	A	100	22.85	33.74	2-2	
							1089.347 1189.918 1283.808	A A A	200 100 100	22.54 22.85 23.60	33.87 33.22 33.22	3-3 2-2 1-2	$5s\ ^3D - 5p\ ^3D^\circ?$ (6)

Sb II

I P 16.5 Anal D List C December 1953

REFERENCES

- A W. F. Meggers, unpublished material (December 1939). W L, I
 B R. J. Lang and E. H. Vestine, Phys. Rev. 42, 233 (1932). W L, (I), T
 K. Murakawa and S. Suwa, Reports Inst. Sci. Tech. Tokyo Univ. 1, 121 (1947) I P, T

Sb II

Sb II

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Vac 1606.96† 1576.09 1643.57 1581.35 1649.28	A A B A A	5e 3e (5) 4e 1e?	0.70 0.38 0.70 0.38 0.70	8.38 8.21 8.21 8.18 8.18	2-3 1-2 2-2 1-1 2-1	5p ² 3P - 5p ³ 3D° (1)	Vac 1374.90 1327.39	A A	3e 5e	0.70 0.38	9.68 9.68	2-2 1-2	5p ² 3P - 5p ³ 1D° (6)
1436.45 1504.18 1565.512 1513.26 1384.67 1438.11	A A B A A A	15e 10e (10) 10e 10e 15e	0.70 0.38 0.70 0.38 0.38 0.00	9.29 8.58 8.58 8.53 9.29 8.58	2-2 1-1 2-1 1-0 1-2 0-1	5p ² 3P - 6s 3P° (2)	1600.40 1762.312	A B	6e (6)	1.58 1.58	9.29 8.58	2-2 2-1	5p ² 1D - 6s 3P° (7)
							1584.57	A	15e	1.58	9.37	2-1	5p ² 1D - 6s 1P° (8)
							1554.00	A	7e	1.58	9.52	2-1	5p ² 1D - 5p ³ 3P° (9)
1498.53	A	8e	0.70	8.94	2-2	5p ² 3P - 5d 3D° (3)	1524.35	A	4e	1.58	9.68	2-2	5p ² 1D - 5p ³ 1D° (10)
1372.80 1317.54	A A	4e 7e	0.38 0.00	9.37 9.37	1-1 0-1	5p ² 3P - 6s 1P° (4)	2190.90	A	(20)	2.95	8.58	0-1	5p ² 1S - 6s 3P° (11)
1407.79 1349.82 1398.97 1358.01 1296.36	A A A A A	8e 4e 1e 4e 4e	0.70 0.38 0.70 0.38 0.00	9.47 9.52 9.52 9.47 9.52	2-2 1-1 2-1 1-2 0-1	5p ² 3P - 5p ³ 3P° (5)	1923.28	A	8e	2.95	9.37	0-1	5p ² 1S - 6s 1P° (12)
							1878.50	A	4e	2.95	9.52	0-1	5p ² 1S - 5p ³ 3P° (13)

Sb III

I P 24.7 Anal C List D August 1953

REFERENCES

- A R. J. Lang, Phys. Rev. 35, 445 (1930). W L, I, T, I P
 R. J. Lang and E. H. Vestine, Phys. Rev. 42, 241 (1932). T

Sb III

Sb III

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Vac 1404.18 1306.69 1429.57	A A A	20 20 10	0.81 0.00 0.81	9.60 9.45 9.45	1½-2½ 0½-1½ 1½-1½	5p 2P° - 5p 2D (1)	Vac 1065.90 1011.94 1084.06	A A A	40 40 20	0.81 0.00 0.81	12.39 12.20 12.20	1½-2½ 0½-1½ 1½-1½	5p 2P° - 5d 2D (4)
1157.74 1075.82	A A	40 30	0.81 0.00	11.47 11.47	1½-0½ 0½-0½	5p 2P° - 6s 2S (2)							
1151.49 1070.43	A A	30 20	0.81 0.00	11.53 11.53	1½-0½ 0½-0½	5p 2P° - 5p 2S (3)	Air 2790.27 2669.39	A A	20 20	12.39 12.20	16.82 16.82	2½-3½ 1½-2½	5d 2D - 5f 2F°† (5)

TELLURIUM, $Z = 52$

Te I

I P 8.97 Anal C February 1961

Further observations are needed for the preparation of An Ultraviolet Multiplet Table. J. E. Ruedy (Phys. Rev. 41, 588, 1932) lists no lines in the short-wave region.

The *raie ultime* is at 2142.75A. (See O. Bartelt, Zeit. Phys. 88, 522 1934).

Te II

I P 18.6 Anal C List D March 1961

REFERENCES

- A M. Bernarda Handrup, Thesis (1960). I P, T, C L, W L, I
 B J. S. Ross, unpublished material from J. E. Mack. W L, (I)

Te II

Te II

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Vac 1274.78 1208.55 1175.79 1174.30 802.28 799.60	A A A A A A	7 9 12 10 8 6	0.00 0.00 0.00 0.00 0.00 0.00	9.68 10.21 10.50 10.51 15.39 15.44	$1\frac{1}{2}-0\frac{1}{2}$ $1\frac{1}{2}-1\frac{1}{2}$ $1\frac{1}{2}-2\frac{1}{2}$ $1\frac{1}{2}-1\frac{1}{2}$ $1\frac{1}{2}-2\frac{1}{2}$ $1\frac{1}{2}-1\frac{1}{2}$	$5p^3\ ^4S^\circ$ - 78448 (1) - 82743 - 85049 - 85160 - 124646 - 125066	Air 2661.10	B	(80)	10.50	15.14	$2\frac{1}{2}-3\frac{1}{2}$	85049 - 122617° (4)
							2711.58 2657.70 2649.66	B B B	(20) (40) (100)	10.51 10.51 10.51	15.06 15.16 15.17	$1\frac{1}{2}-2\frac{1}{2}$ $1\frac{1}{2}-1\frac{1}{2}$ $1\frac{1}{2}-2\frac{1}{2}$	85160 - 122028° (5) - 122775° - 122888°
1374.84 1324.92	A A	10 10	1.53 1.53	10.51 10.85	$2\frac{1}{2}-1\frac{1}{2}$ $2\frac{1}{2}-3\frac{1}{2}$	$5p^2\ ^2D^\circ$ - 85160 (2) - 87900	2942.11	B	(50)	10.96	15.16	$0\frac{1}{2}-1\frac{1}{2}$	88796 - 122775° (6)
Air 2438.69	B	(50)	10.11	15.17	$1\frac{1}{2}-2\frac{1}{2}$	81895 - 122888° (3)	2946.68	B	(50)	10.98	15.17	$1\frac{1}{2}-2\frac{1}{2}$	88961 - 122888° (7)

IODINE, $Z=53$

I I

I P 10.41 Anal A List B February 1961

REFERENCE

A C. C. Kiess and C. H. Corliss, J. Research Nat. Bur. Std. 63A, 1 (1959). I P, T, C L, W L, I

* and §§=Blend in I I and also a blend of I I and I II.

I I

I I

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Vac							Vac						
1830.380†	A	75000	0.00	6.74	$1\frac{1}{2}-2\frac{1}{2}$	$5p^5 2P^\circ - 6s^4 P$	1340.709	A	1500	0.00	9.21	$1\frac{1}{2}-1\frac{1}{2}$	$5p^5 2P^\circ - nd$ 11
1844.451	A	15000	0.94	7.63	$0\frac{1}{2}-1\frac{1}{2}$	(1)	1492.888	A	5000	0.94	9.21	$0\frac{1}{2}-1\frac{1}{2}$	(17)
1617.604	A	5000	0.00	7.63	$1\frac{1}{2}-1\frac{1}{2}$								
1876.415	A	2000	0.94	7.52	$0\frac{1}{2}-0\frac{1}{2}$		*1336.478§§	A	1000	0.00	9.24	$1\frac{1}{2}-2\frac{1}{2}$	$5p^5 2P^\circ - nd$ 13
1642.137	A	2000	0.00	7.52	$1\frac{1}{2}-0\frac{1}{2}$								(18)
1782.758	A	12000	0.00	6.92	$1\frac{1}{2}-1\frac{1}{2}$	$5p^5 2P^\circ - 6s^2 P$	1330.189	A	2000	0.00	9.28	$1\frac{1}{2}-2\frac{1}{2}$	$5p^5 2P^\circ - nd$ 14
1799.091	A	5000	0.94	7.80	$0\frac{1}{2}-0\frac{1}{2}$	(2)							(19)
1582.610	A	1500	0.00	7.80	$1\frac{1}{2}-0\frac{1}{2}$		1465.828	A	2500	0.94	9.36	$0\frac{1}{2}-1\frac{1}{2}$	$5p^5 2P^\circ - nd$ 16†
Air													(20)
2061.633	A	2000	0.94	6.92	$0\frac{1}{2}-1\frac{1}{2}$		1317.542	A	3000	0.00	9.37	$1\frac{1}{2}-2\frac{1}{2}$	$5p^5 2P^\circ - nd$ 17
Vac													(21)
1514.678	A	5000	0.00	8.15	$1\frac{1}{2}-2\frac{1}{2}$	$5p^5 2P^\circ - 6s'^2 D$	1313.947	A	3000	0.00	9.40	$1\frac{1}{2}-2\frac{1}{2}$	$5p^5 2P^\circ - nd$ 18
1702.068	A	15000	0.94	8.19	$0\frac{1}{2}-1\frac{1}{2}$	(3)							(22)
1507.041	A	5000	0.00	8.19	$1\frac{1}{2}-1\frac{1}{2}$		1313.432	A	1500	0.00	9.40	$1\frac{1}{2}-1\frac{1}{2}$	$5p^5 2P^\circ - nd$ 19
1485.918	A	1000	0.00	8.31	$1\frac{1}{2}-1\frac{1}{2}$	$5p^5 2P^\circ - nd$ 1	1459.145	A	4000	0.94	9.40	$0\frac{1}{2}-1\frac{1}{2}$	$5p^5 2P^\circ - nd$ (23)
1675.174	A	1500	0.94	8.31	$0\frac{1}{2}-1\frac{1}{2}$	(4)	1453.179	A	5000	0.94	9.43	$0\frac{1}{2}-0\frac{1}{2}$	$5p^5 2P^\circ - nd$ 19.1
1458.794	A	2500	0.00	8.46	$1\frac{1}{2}-1\frac{1}{2}$	$5p^5 2P^\circ - nd$ 2							(24)
1640.780	A	2500	0.94	8.46	$0\frac{1}{2}-1\frac{1}{2}$	(5)	1302.983	A	3000	0.00	9.47	$1\frac{1}{2}-0\frac{1}{2}$	$5p^5 2P^\circ - nd$ 20
1457.981	A	10000	0.00	8.47	$1\frac{1}{2}-2\frac{1}{2}$	$5p^5 2P^\circ - nd$ 3	1446.260	A	5000	0.94	9.47	$0\frac{1}{2}-0\frac{1}{2}$	$5p^5 2P^\circ - nd$ (25)
1457.470	A	5000*	0.00	8.47	$1\frac{1}{2}-1\frac{1}{2}$	$5p^5 2P^\circ - nd$ 4	1300.335	A	10000	0.00	9.49	$1\frac{1}{2}-2\frac{1}{2}$	$5p^5 2P^\circ - nd$ 21
1639.106	A	200	0.94	8.47	$0\frac{1}{2}-1\frac{1}{2}$	(7)							(26)
1457.389	A	5000*	0.00	8.47	$1\frac{1}{2}-1\frac{1}{2}$	$5p^5 2P^\circ - nd$ 4.1	1291.143	A	300	0.00	9.56	$1\frac{1}{2}-2\frac{1}{2}$	$5p^5 2P^\circ - 8s^4 P$
1425.490	A	8000	0.00	8.66	$1\frac{1}{2}-2\frac{1}{2}$	$5p^5 2P^\circ - nd$ 5							(27)
1421.364	A	2000	0.00	8.69	$1\frac{1}{2}-1\frac{1}{2}$	$5p^5 2P^\circ - nd$ 5.1	1289.395	A	3000	0.00	9.57	$1\frac{1}{2}-1\frac{1}{2}$	$5p^5 2P^\circ - 8s^2 P$
1593.580	A	5000	0.94	8.69	$0\frac{1}{2}-1\frac{1}{2}$	(10)	1429.539	A	800	0.94	9.57	$0\frac{1}{2}-1\frac{1}{2}$	$5p^5 2P^\circ - nd$ (28)
1390.750	A	3000	0.00	8.88	$1\frac{1}{2}-2\frac{1}{2}$	$5p^5 2P^\circ - 7s^4 P^\dagger$	1267.596	A	600*	0.00	9.74	$1\frac{1}{2}-0\frac{1}{2}$	$5p^5 2P^\circ - nd$ 21.2†
1267.569	A	600*	0.00	9.74	$1\frac{1}{2}-1\frac{1}{2}$	(11)							(29)
1412.180	A	200	0.94	9.68	$0\frac{1}{2}-0\frac{1}{2}$		1400.014	A	2000	0.94	9.76	$0\frac{1}{2}-1\frac{1}{2}$	$5p^5 2P^\circ - nd$ 22†
1275.255	A	1500	0.00	9.68	$1\frac{1}{2}-0\frac{1}{2}$								(30)
1383.225	A	4000	0.00	8.92	$1\frac{1}{2}-1\frac{1}{2}$	$5p^5 2P^\circ - 7s^2 P^\dagger$	1259.510	A	3000	0.00	9.80	$1\frac{1}{2}-1\frac{1}{2}$	$5p^5 2P^\circ - nd$ 24
1261.269	A	800	0.00	9.79	$1\frac{1}{2}-0\frac{1}{2}$	(12)	1392.898	A	2000	0.94	9.80	$0\frac{1}{2}-1\frac{1}{2}$	(31)
1367.714	A	2500	0.00	9.03	$1\frac{1}{2}-1\frac{1}{2}$	$5p^5 2P^\circ - nd$ 6	1259.153	A	2500	0.00	9.80	$1\frac{1}{2}-2\frac{1}{2}$	$5p^5 2P^\circ - nd$ 25
1526.448	A	2500	0.94	9.03	$0\frac{1}{2}-1\frac{1}{2}$	(13)							(32)
1360.965	A	5000	0.00	9.07	$1\frac{1}{2}-1\frac{1}{2}$	$5p^5 2P^\circ - nd$ 7	1251.335	A	600	0.00	9.87	$1\frac{1}{2}-2\frac{1}{2}$	$5p^5 2P^\circ - 9s^4 P$
1518.047	A	15000	0.94	9.07	$0\frac{1}{2}-1\frac{1}{2}$	(14)							(33)
1357.971	A	3000	0.00	9.09	$1\frac{1}{2}-1\frac{1}{2}$	$5p^5 2P^\circ - nd$ 8	1250.826	A	400	0.00	9.87	$1\frac{1}{2}-1\frac{1}{2}$	$5p^5 2P^\circ - 9s^2 P$
1514.323	A	2000	0.94	9.09	$0\frac{1}{2}-1\frac{1}{2}$	(15)	1382.284	A	1200	0.94	9.87	$0\frac{1}{2}-1\frac{1}{2}$	(34)
1355.099	A	5000	0.00	9.11	$1\frac{1}{2}-2\frac{1}{2}$	$5p^5 2P^\circ - nd$ 9	1368.217	A	2500	0.94	9.96	$0\frac{1}{2}-1\frac{1}{2}$	$5p^5 2P^\circ - nd$ 26†
						(16)							(35)

I I—Continued

I A	Ref	Int	E P		J	Multiplet No.
			Low	High		
Vac						
1237.892	A	300	0.00	9.97	$1\frac{1}{2}-1\frac{1}{2}$	$5p^5 2P^\circ - nd$ 27
1366.506	A	800	0.94	9.97	$0\frac{1}{2}-1\frac{1}{2}$	(36)
1237.231	A	200	0.00	9.98	$1\frac{1}{2}-2\frac{1}{2}$	$5p^5 2P^\circ - nd$ 27.1
						(37)
1236.362	A	400	0.00	9.98	$1\frac{1}{2}-2\frac{1}{2}$	$5p^5 2P^\circ - nd$ 28.1
						(38)
1233.463	A	300	0.00	10.01	$1\frac{1}{2}-1\frac{1}{2}$	$5p^5 2P^\circ - nd$ 28.2
1361.111	A	3000	0.94	10.01	$0\frac{1}{2}-1\frac{1}{2}$	(39)
1230.732	A	400	0.00	10.03	$1\frac{1}{2}-2\frac{1}{2}$	$5p^5 2P^\circ - 10s$ $4P$
						(40)
1228.888	A	500	0.00	10.05	$1\frac{1}{2}-1\frac{1}{2}$	$5p^5 2P^\circ - nd$ 29
1355.542	A	2000	0.94	10.05	$0\frac{1}{2}-1\frac{1}{2}$	(41)
1224.856	A	400	0.00	10.08	$1\frac{1}{2}-1\frac{1}{2}$	$5p^5 2P^\circ - nd$ 31
						(42)
1224.501	A	300	0.00	10.08	$1\frac{1}{2}-0\frac{1}{2}$	$5p^5 2P^\circ - nd$ 30
1350.206	A	600	0.94	10.08	$0\frac{1}{2}-0\frac{1}{2}$	(43)

I I—Continued

I A	Ref	Int	E P		J	Multiplet No.
			Low	High		
Vac						
1224.077	A	600*	0.00	10.09	$1\frac{1}{2}-1\frac{1}{2}$	$5p^5 2P^\circ - nd$ 31.1†
						(44)
1223.430	A	100	0.00	10.09	$1\frac{1}{2}-1\frac{1}{2}$	$5p^5 2P^\circ - nd$ 32
1348.903	A	800	0.94	10.09	$0\frac{1}{2}-1\frac{1}{2}$	(45)
1343.626	A	1000	0.94	10.13	$0\frac{1}{2}-0\frac{1}{2}$	$5p^5 2P^\circ - nd$ 32.2†
						(46)
1218.411	A	200	0.00	10.13	$1\frac{1}{2}-2\frac{1}{2}$	$5p^5 2P^\circ - 11s$ $4P$
						(47)
1217.142	A	150	0.00	10.14	$1\frac{1}{2}-0\frac{1}{2}$	$5p^5 2P^\circ - nd$ 34
1341.264	A	100	0.94	10.14	$0\frac{1}{2}-0\frac{1}{2}$	(48)
1339.903	A	800	0.94	10.15	$0\frac{1}{2}-0\frac{1}{2}$	$5p^5 2P^\circ - nd$ 35†
						(49)
*1336.478§§	A	1000	0.94	10.18	$0\frac{1}{2}-0\frac{1}{2}$	$5p^5 2P^\circ - nd$ 36.1†
						(50)
1335.238	A	200	0.94	10.18	$0\frac{1}{2}-0\frac{1}{2}$	$5p^5 2P^\circ - nd$ 38†
						(51)

I II

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REFERENCE

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I II

I II

I A	Ref	Int	E P		J	Multiplet No.
			Low	High		
Vac						
1234.063‡	A	20000	0.00	10.00	2-2	$5p^4 3P - 6s$ $5S^\circ$
						(1)
1220.887	A	20000	0.00	10.11	2-2	$5p^4 3P - 5p^5 3P^\circ$
1296.416	A	3000	0.87	10.40	1-1	(2)
1187.338	A	15000	0.00	10.40	2-1	
1200.223	A	7000	0.87	11.16	1-0	
*1336.517§	A	20000	0.87	10.11	1-2	
1285.782	A	1500	0.80	10.40	0-1	
1178.650	A	10000	0.00	10.47	2-1	$5p^4 3P - 6s$ $3S^\circ$
1286.084	A	4000	0.87	10.47	1-1	(3)
1275.596	A	1000	0.80	10.47	0-1	
1166.482	A	20000	0.00	10.58	2-3	$5p^4 3P - 5d$ $5D^\circ$ †
1230.222	A	600	0.80	10.83	0-1	(4)
1160.562	A	10000	0.00	10.64	2-2	
1139.805	A	10000	0.00	10.83	2-1	
1277.190	A	2500	0.87	10.54	1-0	
1075.210	A	3000	0.00	11.48	2-3	$5p^4 3P - 5d$ $3D^\circ$
1198.884	A	5000	0.87	11.17	1-2	(5)
1167.054	A	1500	0.80	11.37	0-1	
1105.000	A	5000	0.00	11.17	2-2	
1175.841	A	5000	0.87	11.37	1-1	
1085.405	A	700	0.00	11.37	2-1	
1034.655	A	10000	0.00	11.93	2-3	$5p^4 3P - 6s'$ $3D^\circ$
1154.668	A	1500	0.87	11.57	1-2	(6)
1131.504	A	2000	0.80	11.71	0-1	
1067.341	A	2000	0.00	11.57	2-2	
1139.752	A	1200	0.87	11.71	1-1	
1054.582	A	150	0.00	11.71	2-1	
1042.154	A	100	0.00	11.85	2-1	$5p^4 3P - 5p^5 1P^\circ$
1125.251	A	3500	0.87	11.85	1-1	(7)
1117.219	A	1500	0.80	11.85	0-1	
Vac						
1018.583	A	4000	0.00	12.12	2-3	$5p^4 3P - 5d'$ $3D^\circ$ †
1111.165	A	2500	0.87	11.98	1-2	(8)
1019.400	A	800	0.80	12.91	0-1	
1030.047	A	800	0.00	11.98	2-2	
1026.065	A	350	0.87	12.91	1-1	
1023.544	A	200	0.00	12.06	2-2	$5p^4 3P - 6s'$ $1D^\circ$
1103.590	A	800	0.87	12.06	1-2	(9)
873.489	A	1500	0.00	14.13	2-2	$5p^4 3P - 5d'$ $3P^\circ$
901.004	A	200	0.87	14.58	1-1	(10)
1101.239	A	400	0.87	12.09	1-0	
931.139	A	100	0.87	14.13	1-2	
895.844	A	400	0.80	14.58	0-1	
1000.572	A	1200	0.00	12.34	2-3	$5p^4 3P - 5d'$ $3F^\circ$
995.768	A	700	0.87	13.27	1-2	(11)
930.133	A	100	0.00	13.27	2-2	
929.143	A	800	0.00	13.29	2-3	$5p^4 3P - 5d'$ $3G^\circ$
						(12)
905.313	A	100	0.00	13.64	2-2	$5p^4 3P - 6s''$ $3P^\circ$ †
1009.936	A	700	0.87	13.10	1-1	(13)
1019.230	A	400	0.87	12.99	1-0	
967.378	A	700	0.87	13.64	1-2	
1003.457	A	500	0.80	13.10	0-1	
921.343	A	400	0.00	13.40	2-2	$5p^4 3P - 5d'$ $1D^\circ$
						(14)
914.957	A	200	0.00	13.49	2-1	$5p^4 3P - 5d'$ $3S^\circ$ †
978.394	A	300	0.87	13.49	1-1	(15)
893.167	A	1000	0.00	13.82	2-1	$5p^4 3P - 6s''$ $1P^\circ$ †
						(16)
881.881	A	1500	0.00	14.00	2-3	$5p^4 3P - 5d'$ $1F^\circ$
						(17)

I II—Continued

I II—Continued

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Vac							Vac						
879.844	A	2000	0.00	14.03	2-3	$5p^4\ ^3P - 5d''\ ^3D^\circ$	1205.931	A	2000	1.69	11.93	2-3	$5p^4\ ^1D - 6s'\ ^3D^\circ$
890.995	A	1000	0.87	14.73	1-2	(18)	1250.559	A	700	1.69	11.57	2-2	(39)
872.391	A	800	0.80	14.95	0-1		1233.069	A	100	1.69	11.71	2-1	
838.070	A	700	0.00	14.73	2-2								
877.276	A	800	0.87	14.95	1-1		1216.125	A	3000	1.69	11.85	2-1	$5p^4\ ^1D - 5p^5\ ^1P^\circ$
825.934	A	300	0.00	14.95	2-1								(40)
870.343	A	900	0.00	14.18	2-1	$5p^4\ ^3P - 5d'\ ^1P^\circ\uparrow$	1184.156	A	200	1.69	12.12	2-3	$5p^4\ ^1D - 5d'\ ^3D^\circ\uparrow$
						(19)	1199.677	A	1000	1.69	11.98	2-2	(41)
847.926	A	1000	0.00	14.56	2-2	$5p^4\ ^3P - 5d''\ ^3P^\circ\uparrow$	1190.853	A	10000	1.69	12.06	2-2	$5p^4\ ^1D - 6s'\ ^1D^\circ$
847.796	A	600	0.87	15.44	1-0?	(20)							(42)
902.130	A	400	0.87	14.56	1-2		1159.871	A	1000	1.69	12.34	2-3	$5p^4\ ^1D - 5d'\ ^3F^\circ$
843.113	A	600	0.00	14.64	2-2	$5p^4\ ^3P - 7s\ ^5S^\circ$	1066.273	A	250	1.69	13.27	2-2	(43)
*896.692	A	400	0.87	14.64	1-2	(21)	1033.801	A	400	1.69	13.64	2-2	$5p^4\ ^1D - 6s''\ ^3P^\circ$
834.095	A	1200	0.00	14.80	2-1	$5p^4\ ^3P - 7s\ ^3S^\circ\uparrow$	1082.540	A	400	1.69	13.10	2-1	(44)
						(22)	1054.742	A	1500	1.69	13.40	2-2	$5p^4\ ^1D - 5d'\ ^1D^\circ$
825.122	A	500	0.00	14.96	2-3	$5p^4\ ^3P - 5d''\ ^3F^\circ\uparrow$							(45)
						(23)	1003.350	A	1000	1.69	14.00	2-3	$5p^4\ ^1D - 5d'\ ^1F^\circ$
863.590	A	600	0.80	15.09	0-1	$5p^4\ ^3P - 6d\ ^5D^\circ\uparrow$							(46)
868.380	A	750	0.87	15.09	1-1	(24)	1003.612	A	300	1.69	14.00	2-2	$5p^4\ ^1D - 5d''\ ^1D^\circ$
818.047	A	700	0.00	15.09	2-1								(47)
798.158	A	1000	0.00	15.47	2-3	$5p^4\ ^3P - 6d\ ^3D^\circ\uparrow$	930.506	A	150	1.69	14.96	2-3	$5p^4\ ^1D - 5d''\ ^3F^\circ$
846.295	A	900	0.87	15.46	1-2	(25)	917.007	A	300	1.69	15.16	2-2	(48)
841.097	A	700	0.80	15.47	0-1		910.309	A	400	1.69	15.26	2-3	$5p^4\ ^1D - 5d''\ ^1F^\circ$
798.427	A	400	0.00	15.46	2-2								(49)
827.797	A	400	0.87	15.79	1-1	$5p^4\ ^3P - 5d''\ ^1P^\circ$	896.376	A	400	1.69	15.47	2-3	$5p^4\ ^1D - 6d\ ^3D^\circ$
823.426	A	170	0.80	15.79	0-1	(26)	*896.692	A	400	1.69	15.46	2-2	(50)
748.781	A	800	0.00	16.49	2-3	$5p^4\ ^3P - 7s'\ ^3D^\circ\uparrow$	895.957	A	200	1.69	15.47	2-1	
*765.594	A	600	0.00	16.12	2-2	(27)							
*765.594	A	600	0.00	16.12	2-1		875.941	A	1000	1.69	15.79	2-1	$5p^4\ ^1D - 5d''\ ^1P^\circ$
737.546	A	500	0.00	16.74	2-3	$5p^4\ ^3P - 7d\ ^3D^\circ$							(51)
770.771	A	300	0.80	16.81	0-1	(28)	855.494	A	400	1.69	16.12	2-2	$5p^4\ ^1D - 7s'\ ^3D^\circ$
740.950	A	300	0.00	16.66	2-2								(52)
773.055	A	500	0.87	16.84	1-1, 2	$5p^4\ ^3P - 6d'\ ^6^\circ\uparrow$	831.168	A	300	1.69	16.55	2-2	$5p^4\ ^1D - 7s'\ ^1D^\circ$
						(29)							(53)
772.344	A	400	0.87	16.86	1-1, 2	$5p^4\ ^3P - 6d'\ ^7^\circ\uparrow$	794.757	A	400	1.69	17.23	2-1, 2	$5p^4\ ^1D - 6d'\ ^{13}^\circ$
						(30)							(54)
727.246	A	800	0.00	16.98	2-3	$5p^4\ ^3P - 6d'\ ^9^\circ$	794.237	A	500	1.69	17.24	2-3	$5p^4\ ^1D - 6d'\ ^{14}^\circ$
						(31)							(55)
722.980	A	1000	0.00	17.08	2-2	$5p^4\ ^3P - 6d'\ ^{10}^\circ$	791.147	A	350	1.69	17.30	2-1	$5p^4\ ^1D - 9s\ ^3S^\circ$
						(32)							(56)
719.546	A	1000	0.00	17.16	2-1	$5p^4\ ^3P - 6d'\ ^{12}^\circ\uparrow$	788.815	A	700	1.69	17.34	2-1	$5p^4\ ^1D - 6d'\ ^{15}^\circ$
						(33)							(57)
706.055	A	400	0.00	17.48	2-3	$5p^4\ ^3P - 8d\ ^3D^\circ\uparrow$							
						(34)	Air						
689.817	A	250	0.00	17.90	2-3	$5p^4\ ^3P - 9d\ ^3D^\circ\uparrow$	2582.794	A	2000	10.62	15.40	4-5	$5d\ ^5D^\circ - 4f\ ^5F\uparrow$
						(35)	2566.242	A	1000	10.58	15.39	3-4	(58)
							2593.458	A	300	10.64	15.40	2-3	
1466.673	A	1000	1.69	10.11	2-2	$5p^4\ ^1D - 5p^5\ ^3P^\circ\uparrow$							
						(36)	3078.754	A	5000	11.48	15.49	3-4	$5d\ ^3D^\circ - 4f\ ^3F\uparrow$
1380.501	A	500	1.69	10.64	2-2	$5p^4\ ^1D - 5d\ ^5D^\circ\uparrow$	2878.632	A	1500	11.17	15.46	2-3	(59)
						(37)	2993.866	A	1000	11.37	15.50	1-2	
1275.424	A	2000	1.69	11.37	2-1	$5p^4\ ^1D - 5d\ ^3D^\circ\uparrow$	2730.124	A	500	12.73	17.25	4-4	$5d'\ ^1G^\circ - 4f'\ ^1G$
						(38)							(60)

XENON, $Z = 54$

Xe I

I P 12.078 Anal A List D February 1953

REFERENCES

- A J. C. Boyce, *Phys. Rev.* **49**, 730 (1936). W L, I, I P
 C. J. Humphreys and W. F. Meggers, *Bur. Std. J. Research* **10**, 146, RP521 (1933). T
 See C. E. Moore, *Atomic Energy Levels*, *Circ. Nat. Bur. Std.* **467**, Vol. III, 113 (1958). T

Xe I

Xe I

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Vac 1469.621†	A	5	0.00	8.40	0-1	$5p^6\ ^1S - 6s\ [1\frac{1}{2}]^\circ$ (1)	Vac 1250.199	A	2	0.00	9.87	0-1	$5p^6\ ^1S - 5d\ [0\frac{1}{2}]^\circ$ (3)
1295.560	A	8d	0.00	9.53	0-1	$5p^6\ ^1S - 6s'\ [0\frac{1}{2}]^\circ$ (2)	1192.04	A	2	0.00	10.36	0-1	$5p^6\ ^1S - 5d\ [1\frac{1}{2}]^\circ$ (4)

Xe II

I P 21.1 Anal A List C January 1954

REFERENCES

- A J. C. Boyce, *Phys. Rev.* **49**, 730 (1936). W L, (I)
 B C. J. Humphreys, *J. Research Nat. Bur. Std.* **22**, 19, RP1164 (1939). W L, I, T, I P

Xe II

Xe II

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Vac 1100.432‡ 1244.756	A A	(10) (5)	0.00 1.30	11.22 11.22	1½-0½ 0½-0½	5p ⁵ 2P° - 5p ⁶ 2S (1)	Vac 803.066 740.406	A A	(3) (3)	1.30 0.00	16.67 16.67	0½-0½ 1½-0½	5p ⁵ 2P° - 7s 4P (8)
1074.476 1183.053 1051.920	A A A	(15) (7) (10)	0.00 1.30 0.00	11.49 11.74 11.74	1½-2½ 0½-1½ 1½-1½	5p ⁵ 2P° - 6s 4P (2)	Air 2864.73	B	150	13.00	17.31	1½-1½	5d 2P - 6p'' 2P° (9)
1048.272 1169.63 1041.306 1158.474 1032.438	A A A A A	(8) (2) (9) (5) (4)	0.00 1.30 0.00 1.30 0.00	11.78 11.86 11.86 11.96 11.96	1½-2½ 0½-1½ 1½-1½ 0½-0½ 1½-0½	5p ⁵ 2P° - 5d 4D (3)							
972.769 1083.860	A A	(7) (5)	0.00 1.30	12.69 12.69	1½-1½ 0½-1½	5p ⁵ 2P° - 6s 2P (4)							
1037.680 935.405	A A	(6) (2)	1.30 0.00	13.20 13.20	0½-0½ 1½-0½	5p ⁵ 2P° - 5d 4P (5)	2979.32	B	300	13.14	17.29	2½-2½	5d 4P - 15° (10)
925.866 976.678 885.54	A A A	(5) (6) (3)	0.00 1.30 0.00	13.33 13.94 13.94	1½-2½ 0½-1½ 1½-1½	5p ⁵ 2P° - 6s' 2D (6)	2895.22	B	150h	14.17	18.43	2½-2½	5d' 2F - 35° (11)
880.802	A	(5)	1.30	15.32	0½-0½	5p ⁵ 2P° - 6s'' 2S (7)	Strongest Unclassified Line of Xe II						
							Air 2475.89	B	100				

Xe III

I P 32.0 Anal A List D October 1953

REFERENCES

- A J. C. Boyce, Phys. Rev. **49**, 730 (1936). W L, I
C. J. Humphreys, J. Research Nat. Bur. Std. **16**, 639, RP898 (1936). W L, T, I P

Xe III

Xe III

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Vac 1017.680 1066.391 965.540 1003.370 1130.344 1047.801	A A A A A A	35 12 10 35 30 10	0.00 1.21 0.00 1.21 1.21 1.00	12.13 12.79 12.79 13.51 12.13 12.79	2-2 1-1 2-1 1-0 1-2 0-1	5p ⁴ 3P - 5p ⁵ 3P° (1)	Vac 796.070	A	12	0.00	15.51	2-1	5p ⁴ 3P - 6s 3S°† (5)
896.003 893.989 889.276	A A A	20 20 15	0.00 0.00 0.00	13.78 13.81 13.88	2-3 2-2 2-1	5p ⁴ 3P - 5d 5D°† (2)	792.896 *779.126	A A	15 25	0.00 0.00	15.57 15.84	2-3 2-2?	5p ⁴ 3P - 5d' 3F° (6)
824.881 801.980	A A	30 15	0.00 0.00	14.97 15.39	2-3 2-2	5p ⁴ 3P - 5d 3D°† (3)	721.199 742.566	A A	10 15	0.00 0.00	17.12 16.62	2-3 2-2	5p ⁴ 3P - 6s' 3D°† (7)
823.210	A	25	0.00	15.00	2-2	5p ⁴ 3P - 6s 5S°† (4)	733.314	A	10	0.00	16.83	2-2	5p ⁴ 3P - 5d' 41°† (8)
							698.541 756.031 769.143 *779.126	A A A A	20 10 10 25	0.00 1.21 1.00 1.21	17.67 17.54 17.05 17.05	2-3 1-2 0-1 1-1	5p ⁴ 3P - 5d' 3D°† (9)

CESIUM, $Z = 55$

Cs I

I P 3.877 Anal A February 1954

REFERENCES

- H. R. Kratz, Phys. Rev. 75, 1844 (1949). W L, T, I P
 H. Beutler und K. Guggenheimer, Zeit. Phys. 88, 25 (1934). W L, T
 See also "Atomic Energy Levels" Circ. Nat. Bur. Std. 467, Vol. III, 124 (1958).

Cs I

All members of the $6s\ 2S-np\ 2P^\circ$ series, which is now observed from $n=6$ to 73, are in the wavelength region longer than 3183 Å. All ultraviolet observations are from the ground term to levels above the ionization limit.

Cs II

I P 25.0 Anal B List C January 1954

REFERENCES

- A M. Wheatley and R. Sawyer, Phys. Rev. 61, 591 (1942). W L, I, T
 B J. Olthoff and R. A. Sawyer, Phys. Rev. 42, 766 (1932). W L, (I), (T)
 R. A. Boyd and R. A. Sawyer, Phys. Rev. 61, 601 (1942). I P

Cs II

Cs II

I A	Ref	Int	E P		J	Multiplet No.		I A	Ref	Int	E P		J	Multiplet No.
			Low	High							Low	High		
Vac 926.75†	B	(20)	0.00	13.32	0-1	$5p^6\ 1S$	$-6s\ [1\frac{1}{2}]^\circ$ (1)	Air 2881.19	A	15	15.11	19.39	0-1	$6s'\ [0\frac{1}{2}]^\circ-15$ (8)
813.85	B	(20)	0.00	15.17	0-1	$5p^6\ 1S$	$-6s'\ [0\frac{1}{2}]^\circ$ (2)	2931.09	A	20	15.26	19.47	1-0	$5d'\ [1\frac{1}{2}]^\circ-16$ (9)
901.34	B	(20)	0.00	13.70	0-1	$5p^6\ 1S$	$-5d\ [1\frac{1}{2}]^\circ$ (3)	2748.23	A	15	15.81	20.30	2-1	$6p\ [2\frac{1}{2}]^\circ-30^\circ$ (10)
808.77	B	(20)	0.00	15.26	0-1	$5p^6\ 1S$	$-5d'\ [1\frac{1}{2}]^\circ$ (4)	2392.86	A	15	16.14	21.30	2-3	$6p\ [1\frac{1}{2}]^\circ-47^\circ$ (11)
668.43	B	(12)	0.00	18.47	0-1	$5p^6\ 1S$	$-6d\ [0\frac{1}{2}]^\circ$ (5)	2776.99 2609.44	A A	15 15	18.86 18.86	23.31 23.59	2-2 2-3	$6d\ [1\frac{1}{2}]^\circ-27$ (12)25
639.42	B	(12)	0.00	19.31	0-1	$5p^6\ 1S$	-23° (6)	2816.94 2651.71 2254.58	A A A	20 12 15	18.93 18.93 18.93	23.31 23.58 24.40	2-2 2-2 2-3	$20^\circ-27$ (13)26 22
Air 2257.82	A	12	13.86	19.32	4-3	$5d\ [3\frac{1}{2}]^\circ-13$ (7)		2568.69	A	15	18.96	23.76	3-2	$21^\circ-24$
								2267.61	A	20	18.96	24.40	3-3	(14)22
								2573.03	A	30	18.97	23.77	3-3	$22^\circ-23$
								2273.83	A	20	18.97	24.40	3-3	(15)22

I A	Ref	Int	E P		<i>J</i>	Multiplet No.	I A	Ref	Int	E P		<i>J</i>	Multiplet No.
			Low	High						Low	High		
Vac 1999.54 Air 2024.18	B	(3)	0.00	6.17	0½-1½	6s ²S -7p ²P° (1)	Vac 1924.77 1904.16	B	(5)	0.70	7.11	2½-3½	5d ²D -5f ²F° (4)
	B	(4)	0.00	6.10	0½-0½			B	(1)	0.60	7.08	1½-2½	
			-----	-----					-----	-----			
2335.269	A	10R	0.70	5.99	2½-3½	5d ²D -4f ²F°	Air 2771.348	A	3r	2.71	7.16	1½-0½	6p ²P° -8s ²S
2304.248	A	8R	0.60	5.96	1½-2½	(2)	2647.264	A	4r	2.50	7.16	0½-0½	(5)
2347.592	A	6	0.70	5.96	2½-2½								
2254.73	C	10	0.70	6.17	2½-1½	5d ²D -7p ²P°	2634.778	A	7r	2.71	7.39	1½-2½	6p ²P° -7d ²D
2245.61	C	8	0.60	6.10	1½-0½	(3)	2528.404	P	-	2.50	7.38	0½-1½	(6)
2214.7	C	5	0.60	6.17	1½-1½		2641.369	A	2r	2.71	7.38	1½-1½	

LANTHANUM, $Z = 57$

La I

I P 5.59 $\pm$ 0.03 Anal A List A March 1954

REFERENCE

A W. F. Meggers, See H. N. Russell and W. F. Meggers, Bur. Std. J. Research 9, 625, RP497 (1932).
W L, I, T, I P

La I

La I

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Air 2722.31	A	6	0.00	4.53	1½-	$a^2D - 10^\circ$ (1)	Air 2766.46 2729.85	A A	4 5	0.43 0.37	4.89 4.89	3½- 2½-	$a^4F - 13^\circ$ (4)
2725.57	A	15	0.13	4.66	2½-3½?	$a^2D - 11^\circ$ (2)	2761.56 2714.52	A A	7 8	0.51 0.43	4.98 4.98	4½- 3½-	$a^4F - 14^\circ$ (5)
2707.07	A	3	0.33	4.89	1½-	$a^4F - 12^\circ$ (3)	2677.77 2653.48	A A	2 2	0.37 0.33	4.98 4.98	2½- 1½-	$a^4F - 15^\circ$ (6)

La II

I P 11.39 Anal A List C March 1954

REFERENCE

A W. F. Meggers, see H. N. Russell and W. F. Meggers, Bur. Std. J. Research 9, 628, RP497 (1932).
W L, I, T, I P

La II

La II

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Air 2187.87	A	40	0.00	5.64	2-1	$a^3F - x^1P^\circ$ (1)	Air 2596.08	A	20	2.05	6.80	4-4	$z^1G^\circ - e^3H^\dagger$ (8)
2256.77	A	50	0.17	5.64	2-1	$a^1D - x^1P^\circ$ (2)	2399.64	A	20hl	2.05	7.19	4-4	$z^1G^\circ - g^3F$ (9)
2319.44	A	20	0.32	5.64	2-1	$a^3D - x^1P^\circ$ (3)	2325.75	A	20hl	2.05	7.35	4-4	$z^1G^\circ - g^1G$ (10)
2533.14	A	15	0.77	5.64	2-1	$a^3P - x^1P^\circ$ (4)	2560.37 2519.22 2487.59 2582.96 2552.60 2455.88	A A A A A A	50 50 40 8 7 10	2.37 2.25 2.12 2.37 2.25 2.12	7.19 7.15 7.09 7.15 7.09 7.15	4-4 3-3 2-2 4-3 3-2 2-3	$y^3F^\circ - g^3F$ (11)
2610.34	A	150	0.91	5.64	0-1	$a^1S - x^1P^\circ$ (5)	2479.85	A	10l	2.37	7.35	4-4	$y^3F^\circ - g^1G$ (12)
2808.39	A	150	1.25	5.64	2-1	$b^1D - x^1P^\circ$ (6)	2695.47 2672.90 2681.49	A A A	35 30 10	2.44 2.29 2.20	7.02 6.91 6.80	6-6 5-5 4-4	$z^3H^\circ - e^3H^\dagger$ (13)
2580.82 2566.09 2582.55	A A A	8hl 10hl 6	1.94 1.77 1.75	6.72 6.58 6.53	4-5 3-4 2-3	$z^3F^\circ - f^3G$ (7)	2472.44	A	10	2.20	7.19	4-4	$z^3H^\circ - g^3F$ (14)

La II—Continued

La II—Continued

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Air *2561.84	A	20l	2.33	7.15	2-3	$z^1D^\circ - g^3F^\dagger$ (15)	2436.42	A	15	2.87	7.94	2-2	$z^3P^\circ - g^3P$ (25)
2438.02	A	20	2.33	7.39	2-2	$z^1D^\circ - h^1D$ (16)	2438.42	A	10	2.80	7.86	1-1	
							2471.06	A	5	2.87	7.86	2-1	
							2452.73	A	8	2.80	7.83	1-0	
							2404.65	A	6	2.80	7.94	1-2	
2317.82	A	20hl	2.33	7.66	2-2	$z^1D^\circ - i^1D$ (17)	2437.14	A	10	2.80	7.86	0-1	
3025.88	A	4?	2.75	6.83	5-4	$z^3G^\circ - f^3F$ (18)	2855.90	A	50hl	3.03	7.35	3-4	$y^1F^\circ - g^1G$ (26)
2983.44	A	3	2.63	6.77	4-3								
2985.76	A	2	2.52	6.65	3-2		2631.94	A	8	3.03	7.72	3-2	$y^1F^\circ - f^3P$ (27)
2862.98	A	15hl	2.52	6.83	3-4								
2893.08	A	60	2.75	7.02	5-6	$z^3G^\circ - e^3H^\dagger$ (19)	2923.90	A	20	3.50	7.72	3-2	$y^3D^\circ - f^3P^\dagger$ (28)
2885.13	A	50	2.63	6.91	4-5		2962.90	A	15	3.38	7.55	2-1	
2880.65	A	40	2.52	6.80	3-4		2929.86	A	7	3.21	7.42	1-0	
2778.76	A	10	2.75	7.19	5-4	$z^3G^\circ - g^3F^\dagger$ (20)	2779.78	A	10	3.50	7.94	3-2	$y^3D^\circ - g^3P^\dagger$ (29)
2732.40	A	10	2.63	7.15	4-3		2752.84	A	10	3.38	7.86	2-1	
2702.13	A	8	2.52	7.09	3-2		2666.54	A	3	3.21	7.83	1-0	
2798.56	A	40hl	2.78	7.19	3-4	$z^3D^\circ - g^3F^\dagger$ (21)	3059.91	A	8	3.39	7.42	1-0	$z^1P^\circ - f^3P^\dagger$ (30)
2791.51	A	25	2.73	7.15	2-3								
2780.23	A	20	2.65	7.09	1-2		2767.40	A	8	3.48	7.94	1-2	$y^3P^\circ - g^3P$ (31)
2501.18	A	15hl	2.78	7.72	3-2	$z^3D^\circ - f^3P^\dagger$ (22)							
*2561.84	A	20l	2.73	7.55	2-1		2840.51	A	25hl	3.64	7.99	2-3	$y^3P^\circ - h^3D^\dagger$ (32)
2586.35	A	10	2.65	7.42	1-0		2748.31	A	8	3.48	7.97	1-2	
2531.60	A	8	2.78	7.66	3-2	$z^3D^\circ - i^1D$ (23)	2715.43	A	10hl	3.40	7.95	0-1	
2546.40	A	20hl	2.87	7.72	2-2	$z^3P^\circ - f^3P^\dagger$ (24)	2950.50	A	50	3.52	7.70	5-6	$z^1H^\circ - e^1I$ (33)
2601.79	A	5	2.80	7.55	1-1								

Strongest Unclassified Lines of La II

Air 2445.56	A	10h					Air 2142.81	A	20hl				
2163.66	A	20hl											

La III

I P 19.09 Anal A List A April 1954

REFERENCES

- A H. N. Russell and W. F. Meggers, Bur. Std. J. Research 9, 625 RP497 (1932). W L, I, T, I P
 B R. J. Lang, Canadian J. Research [A] 13, 4 (1935). W L, (I), T

La III

La III

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Air 2297.75	A	200	0.20	5.57	$2\frac{1}{2} - 1\frac{1}{2}$	$5d^2D - 6p^2P^\circ$ (1)	2651.60	A	300	5.57	10.22	$1\frac{1}{2} - 2\frac{1}{2}$	$6p^2P^\circ - 6d^2D$ (3)
2379.38	A	200	0.00	5.19	$1\frac{1}{2} - 0\frac{1}{2}$		2476.72	A	100	5.19	10.17	$0\frac{1}{2} - 1\frac{1}{2}$	
2216.08	A	50	0.00	5.57	$1\frac{1}{2} - 1\frac{1}{2}$		2682.46	A	30	5.57	10.17	$1\frac{1}{2} - 1\frac{1}{2}$	
Vac 1099.73	B	(15)	0.20	11.42	$2\frac{1}{2} - 3\frac{1}{2}$	$5d^2D - 4f^2F^\circ$ (2)	2684.90	A	50	5.57	10.17	$1\frac{1}{2} - 0\frac{1}{2}$	$6p^2P^\circ - 7s^2S$ (4)
1081.61	B	(15)	0.00	11.41	$1\frac{1}{2} - 2\frac{1}{2}$		2478.8	A	20	5.19	10.17	$0\frac{1}{2} - 0\frac{1}{2}$	
1100.70	B	(7)	0.20	11.41	$2\frac{1}{2} - 2\frac{1}{2}$		Vac 1462.26	B	(5)	5.57	14.01	$1\frac{1}{2} - 0\frac{1}{2}$	$6p^2P^\circ - 8s^2S$ (5)
							1399.01	B	(2)	5.19	14.01	$0\frac{1}{2} - 0\frac{1}{2}$	

HAFNIUM, $Z = 72$

Hf I

I P 6.8 Anal B List C July 1961

REFERENCE

A W. F. Meggers, unpublished material (July 1959). I P, T, W L, C L, I, Z E

Hf I

Hf I

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Air							Air						
3119.980	A	100	0.56	4.52	4-3	$a^3F - x^3D^\circ$	2904.412	A	400	0.56	4.81	4-4	$a^3F - v^3F^\circ \dagger$
3067.426	A	200	0.29	4.31	3-2	(1)							(11)
3016.80	A	200	0.00	4.09	2-1								
2918.591	A	300	0.29	4.52	3-3		3291.043	A	150	0.81	4.56	1-1	$a^3P - u^3D^\circ \dagger$
2860.558	A	100	0.00	4.31	2-2		2966.953	A	150	0.81	4.97	1-2	(12)
2730.700	A	50	0.00	4.52	2-3								
							2973.390	A	100	0.81	4.96	1-2	$a^3P - v^3F^\circ \dagger$
3172.949	A	300	0.56	4.45	4-4	$a^3F - x^3F^\circ$							(13)
3164.385	A	100	0.29	4.19	3-3	(2)	2924.613	A	150	0.68	4.90	0-1	$a^3P - 39704^\circ \dagger$
2980.815	A	500	0.00	4.14	2-2								(14)
3402.512	A	200	0.56	4.19	4-3		2887.542	A	100	0.81	5.09	1-1	$a^3P - 41193^\circ \dagger$
3206.108	A	150	0.29	4.14	3-2								(15)
2964.885	A	400	0.29	4.45	3-4		2929.395	A	200	1.11	5.32	2-3	$a^3P - 43104^\circ$
2944.71	A	200	0.00	4.19	2-3								(16)
							*2850.967	A	100	1.11	5.44	2-3	$a^3P - 44049^\circ$
3096.764	A	150	0.56	4.55	4-4	$a^3F - w^3F^\circ$							(17)
3020.530	A	300	0.29	4.38	3-3	(3)	2817.685	A	100	1.11	5.49	2-3	$a^3P - 44463^\circ$
2940.762	A	800	0.00	4.20	2-2								(18)
3236.76	A	100	0.56	4.38	4-3		2979.288	A	100	0.70	4.84	2-3	$a^1D - v^3D^\circ \dagger$
3159.84	A	300	0.29	4.20	3-2								(19)
2898.256	A	500	0.29	4.55	3-4		2845.832	A	200	0.70	5.03	2-3	$a^1D - u^3D^\circ$
2819.746	A	100	0.00	4.38	2-3								(20)
							2958.01	A	300	0.70	4.87	2-2	$a^1D - x^3P^\circ$
2954.201	A	500	0.56	4.74	4-3	$a^3F - w^3D^\circ \dagger$	3074.789	A	100	0.70	4.71	2-1	(21)
2904.760	A	300	0.29	4.54	3-2	(4)							
2889.62	A	300	0.00	4.27	2-1		*2850.967	A	100	0.70	5.02	2-1	$a^1D - 40704^\circ$
													(22)
3306.110	A	300	0.56	4.30	4-4	$a^3F - z^1G^\circ$	2743.677	A	100	0.70	5.19	2-2	$a^1D - 42075^\circ$
3080.842	A	200	0.29	4.30	3-4	(5)							(23)
							2668.290	A	90	0.70	5.32	2-3	$a^1D - 43104^\circ$
2866.373	A	500	0.00	4.31	2-3	$a^3F - y^1F^\circ \dagger$							(24)
						(6)							
2887.132	A	200	0.56	4.84	4-3	$a^3F - v^3D^\circ \dagger$	2982.727	A	150	1.30	5.44	4-3	$a^1G - 44049^\circ$
2779.370	A	150	0.29	4.73	3-2	(7)							(25)
2833.285	A	150	0.00	4.36	2-1								
3156.688	A	200	0.56	4.47	4-3	$a^3F - x^1F^\circ$							
2950.670	A	600	0.29	4.47	3-3	(8)							
2758.771	A	80	0.00	4.47	2-3								
2761.634	A	200	0.56	5.03	4-3	$a^3F - u^3D^\circ \dagger$							
2636.997	A	50	0.29	4.97	3-2	(9)							
2705.612	A	100	0.00	4.56	2-1								
2916.48	A	800	0.56	4.80	4-5	$a^3F - x^3G^\circ \dagger$							
3057.010	A	400	0.56	4.60	4-4	(10)							

Hf II

I P 14.8 Anal A List C March 1961

REFERENCE

A W. F. Meggers, unpublished material (January 1957). I P, T, C L, W L, I

Hf II

Hf II

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Air							Air						
2820.23	A	400	0.38	4.75	$2\frac{1}{2}-3\frac{1}{2}$	$a^2D - z^4G^\circ$	2410.13	A	100	1.03	6.15	$4\frac{1}{2}-4\frac{1}{2}$	$a^4F - z^2G^\circ \uparrow$
2861.01	A	300	0.00	4.31	$1\frac{1}{2}-2\frac{1}{2}$	(1)	2449.43	A	100	0.78	5.82	$3\frac{1}{2}-3\frac{1}{2}$	(15)
3134.72	A	1000	0.38	4.31	$2\frac{1}{2}-2\frac{1}{2}$		2576.83	A	150	1.03	5.82	$4\frac{1}{2}-3\frac{1}{2}$	
2582.51	A	200	0.38	5.16	$2\frac{1}{2}-2\frac{1}{2}$	$a^2D - y^2D^\circ$	2961.80	A	100	1.60	5.76	$1\frac{1}{2}-1\frac{1}{2}$	$a^4P - y^4D^\circ \uparrow$
2638.71	A	400	0.00	4.68	$1\frac{1}{2}-1\frac{1}{2}$	(2)	2967.23	A	200	1.48	5.63	$0\frac{1}{2}-0\frac{1}{2}$	(16)
2869.83	A	100	0.38	4.68	$2\frac{1}{2}-1\frac{1}{2}$		2977.59	A	100	1.60	5.74	$1\frac{1}{2}-0\frac{1}{2}$	$a^4P - z^2S^\circ \uparrow$
2393.83	A	100	0.00	5.16	$1\frac{1}{2}-2\frac{1}{2}$	(3)	2968.94	A	100	1.66	5.82	$2\frac{1}{2}-3\frac{1}{2}$	$a^4P - z^2G^\circ$
2606.37	A	200	0.38	5.11	$2\frac{1}{2}-3\frac{1}{2}$	$a^2D - z^2F^\circ$	2814.48	A	250	1.66	6.05	$2\frac{1}{2}-2\frac{1}{2}$	$a^4P - x^2D^\circ \uparrow$
2591.33	A	100	0.00	4.76	$1\frac{1}{2}-2\frac{1}{2}$	(4)	2852.01	A	100	1.60	5.92	$1\frac{1}{2}-1\frac{1}{2}$	(19)
2813.87	A	200	0.38	4.76	$2\frac{1}{2}-2\frac{1}{2}$		2898.71	A	200	1.66	5.92	$2\frac{1}{2}-1\frac{1}{2}$	
2417.69	A	150	0.38	5.48	$2\frac{1}{2}-3\frac{1}{2}$	$a^2D - y^4F^\circ \uparrow$	2706.73	A	100	1.66	6.22	$2\frac{1}{2}-1\frac{1}{2}$	$a^4P - y^4P^\circ \uparrow$
2460.49	A	300	0.38	5.39	$2\frac{1}{2}-2\frac{1}{2}$	(5)	2665.98	A	100	1.60	6.22	$1\frac{1}{2}-1\frac{1}{2}$	(20)
2351.21	A	150	0.00	5.25	$1\frac{1}{2}-1\frac{1}{2}$		2425.98	A	100	1.66	6.75	$2\frac{1}{2}-2\frac{1}{2}$	$a^4P - x^4D^\circ \uparrow$
2516.88	A	500	0.38	5.28	$2\frac{1}{2}-1\frac{1}{2}$	$a^2D - y^2P^\circ \uparrow$	2548.19	A	60	1.66	6.51	$2\frac{1}{2}-1\frac{1}{2}$	(21)
2322.48	A	100	0.00	5.31	$1\frac{1}{2}-0\frac{1}{2}$	(6)	2515.49	A	100	1.66	6.57	$2\frac{1}{2}-3\frac{1}{2}$	$a^4P - w^2F^\circ \uparrow$
2400.80	A	80	0.38	5.52	$2\frac{1}{2}-3\frac{1}{2}$	$a^2D - y^2F^\circ$	2404.56	A	40	1.66	6.80	$2\frac{1}{2}-2\frac{1}{2}$	$a^4P - x^4P^\circ \uparrow$
2277.16	A	200	0.00	5.42	$1\frac{1}{2}-2\frac{1}{2}$	(7)	2463.94	A	60	1.60	6.60	$1\frac{1}{2}-1\frac{1}{2}$	(23)
2447.25	A	300	0.38	5.42	$2\frac{1}{2}-2\frac{1}{2}$		2473.90	A	100	1.60	6.58	$1\frac{1}{2}-0\frac{1}{2}$	
2641.41 $\dagger$	A	800	1.03	5.70	$4\frac{1}{2}-5\frac{1}{2}$	$a^4F - z^4G^\circ \uparrow$	2469.17	A	100	1.66	6.66	$2\frac{1}{2}-3\frac{1}{2}$	$a^4P - y^2G^\circ$
2773.36	A	400	0.78	5.23	$3\frac{1}{2}-4\frac{1}{2}$	(8)	2789.83	A	50	1.49	5.91	$2\frac{1}{2}-2\frac{1}{2}$	$a^2F - y^4D^\circ \uparrow$
2975.89	A	600	0.61	4.75	$2\frac{1}{2}-3\frac{1}{2}$		3046.03	A	200	1.86	5.91	$3\frac{1}{2}-2\frac{1}{2}$	(25)
3194.20	A	800	0.45	4.31	$1\frac{1}{2}-2\frac{1}{2}$		2876.33	A	300	1.86	6.15	$3\frac{1}{2}-4\frac{1}{2}$	$a^2F - z^2G^\circ$
2937.78	A	800	1.03	5.23	$4\frac{1}{2}-4\frac{1}{2}$		2849.21	A	300	1.49	5.82	$2\frac{1}{2}-3\frac{1}{2}$	(26)
3109.12	A	1000	0.78	4.75	$3\frac{1}{2}-3\frac{1}{2}$		3116.95	A	100	1.86	5.82	$3\frac{1}{2}-3\frac{1}{2}$	
3328.21	A	70	0.61	4.31	$2\frac{1}{2}-2\frac{1}{2}$		2947.14	A	100	1.86	6.05	$3\frac{1}{2}-2\frac{1}{2}$	$a^2F - x^2D^\circ \uparrow$
3495.75	A	250	0.78	4.31	$3\frac{1}{2}-2\frac{1}{2}$		2706.64	A	70	1.49	6.05	$2\frac{1}{2}-2\frac{1}{2}$	(27)
2822.68	A	300	0.78	5.16	$3\frac{1}{2}-2\frac{1}{2}$	$a^4F - y^2D^\circ$	2683.35	A	400	1.86	6.46	$3\frac{1}{2}-3\frac{1}{2}$	$a^2F - x^2F^\circ \uparrow$
3031.16	A	600	0.61	4.68	$2\frac{1}{2}-1\frac{1}{2}$	(9)	2573.91	A	150	1.49	6.28	$2\frac{1}{2}-2\frac{1}{2}$	(28)
2712.42	A	100	0.61	5.16	$2\frac{1}{2}-2\frac{1}{2}$		2657.49	A	50	1.86	6.51	$3\frac{1}{2}-2\frac{1}{2}$	$a^2F - w^2D^\circ$
2919.59	A	500	0.45	4.68	$1\frac{1}{2}-1\frac{1}{2}$		2559.19	A	100	1.49	6.31	$2\frac{1}{2}-1\frac{1}{2}$	(29)
2622.74	A	400	0.45	5.16	$1\frac{1}{2}-2\frac{1}{2}$		2500.74	A	100	1.86	6.80	$3\frac{1}{2}-2\frac{1}{2}$	$a^2F - x^4P^\circ \uparrow$
2808.00	A	300	0.61	5.00	$2\frac{1}{2}-2\frac{1}{2}$	$a^4F - z^4P^\circ \uparrow$	2413.34	A	30	1.49	6.60	$2\frac{1}{2}-1\frac{1}{2}$	(30)
2712.00	A	30	0.45	5.00	$1\frac{1}{2}-2\frac{1}{2}$	(10)	2096.18	A	100	1.86	7.75	$3\frac{1}{2}-2\frac{1}{2}$	$a^2F - v^2F^\circ \uparrow$
3025.29	A	200	1.03	5.11	$4\frac{1}{2}-3\frac{1}{2}$		2829.33	A	80	2.14	6.51	$2\frac{1}{2}-2\frac{1}{2}$	$b^2D - w^2D^\circ \uparrow$
3101.39	A	400	0.78	4.76	$3\frac{1}{2}-2\frac{1}{2}$		2718.50	A	100	1.77	6.31	$1\frac{1}{2}-1\frac{1}{2}$	(32)
2851.21	A	200	0.78	5.11	$3\frac{1}{2}-3\frac{1}{2}$		2433.56	A	100	2.14	7.22	$2\frac{1}{2}-3\frac{1}{2}$	$b^2D - x^4D^\circ \uparrow$
2968.81	A	500	0.61	4.76	$2\frac{1}{2}-2\frac{1}{2}$		2478.55	A	30	1.77	6.75	$1\frac{1}{2}-2\frac{1}{2}$	(33)
2738.77	A	400	0.61	5.11	$2\frac{1}{2}-3\frac{1}{2}$		2651.17	A	100	2.14	6.80	$2\frac{1}{2}-1\frac{1}{2}$	$b^2D - x^2P^\circ \uparrow$
2861.70	A	500	0.45	4.76	$1\frac{1}{2}-2\frac{1}{2}$		2789.50	A	100	2.15	6.57	$4\frac{1}{2}-3\frac{1}{2}$	$a^2G - w^2F^\circ$
2647.30	A	500	1.03	5.69	$4\frac{1}{2}-4\frac{1}{2}$	$a^4F - y^4F^\circ$	2814.77	A	100	2.19	6.57	$3\frac{1}{2}-3\frac{1}{2}$	(35)
2626.95	A	50	0.78	5.48	$3\frac{1}{2}-3\frac{1}{2}$	(11)	2551.37	A	200*	2.15	6.98	$4\frac{1}{2}-5\frac{1}{2}$	$a^2G - z^2H^\circ \uparrow$
2578.15	A	100	0.61	5.39	$2\frac{1}{2}-2\frac{1}{2}$		2789.72	A	200	2.19	6.61	$3\frac{1}{2}-4\frac{1}{2}$	(36)
2571.68	A	400	0.45	5.25	$1\frac{1}{2}-1\frac{1}{2}$		2613.61	A	200	2.15	6.87	$4\frac{1}{2}-4\frac{1}{2}$	$a^2G - y^2G^\circ \uparrow$
2774.01	A	100	1.03	5.48	$4\frac{1}{2}-3\frac{1}{2}$		2756.92	A	80	2.19	6.66	$3\frac{1}{2}-3\frac{1}{2}$	(37)
2677.56	A	20	0.78	5.39	$3\frac{1}{2}-2\frac{1}{2}$		2129.10	A	100	2.19	7.98	$3\frac{1}{2}-2\frac{1}{2}$	$a^2G - u^2D^\circ$
2657.85	A	100	0.61	5.25	$2\frac{1}{2}-1\frac{1}{2}$								(38)
2513.02	A	300	0.78	5.69	$3\frac{1}{2}-4\frac{1}{2}$								
2531.19	A	200	0.61	5.48	$2\frac{1}{2}-3\frac{1}{2}$								
2496.99	A	200	0.45	5.39	$1\frac{1}{2}-2\frac{1}{2}$								
2537.33	A	100	0.45	5.31	$1\frac{1}{2}-0\frac{1}{2}$	$a^4F - y^2P^\circ \uparrow$							
2751.82	A	200	1.03	5.52	$4\frac{1}{2}-3\frac{1}{2}$	(12)							
2661.89	A	200	0.78	5.42	$3\frac{1}{2}-2\frac{1}{2}$								
2607.03	A	400	0.78	5.52	$3\frac{1}{2}-3\frac{1}{2}$	$a^4F - y^2F^\circ$							
2563.61	A	150	0.61	5.42	$2\frac{1}{2}-2\frac{1}{2}$	(13)							
2512.69	A	200	0.61	5.52	$2\frac{1}{2}-3\frac{1}{2}$								
2483.34	A	40	0.45	5.42	$1\frac{1}{2}-2\frac{1}{2}$								
2464.19	A	300	1.03	6.04	$4\frac{1}{2}-3\frac{1}{2}$	$a^4F - y^4D^\circ \uparrow$							
2405.42	A	200	0.78	5.91	$3\frac{1}{2}-2\frac{1}{2}$	(14)							
2393.36	A	80	0.61	5.76	$2\frac{1}{2}-1\frac{1}{2}$								
2380.30	A	80	0.45	5.63	$1\frac{1}{2}-0\frac{1}{2}$								
2347.44	A	120	0.78	6.04	$3\frac{1}{2}-3\frac{1}{2}$								
2324.89	A	60	0.61	5.91	$2\frac{1}{2}-2\frac{1}{2}$								
2323.26	A	60	0.45	5.76	$1\frac{1}{2}-1\frac{1}{2}$								

TANTALUM, $Z=73$

Ta I

I P 7.9 Anal B List D April 1961

REFERENCES

- A C. C. Kiess and H. K. Kiess, unpublished material (March 1961). I P, T, C L, W L, I
 See C. E. Moore, *Atomic Energy Levels*, Circ. Nat. Bur. Std. 467, Vol. III, 149 (1958). I P, T
 * and §=Blend of Ta I and Ta II

Ta I

Ta I

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Air 2965.54	A	25	0.25	4.41	$2\frac{1}{2}-1\frac{1}{2}$	$a^4F - 35721^\circ$ (1)	Air 2848.51 2698.29 2559.43	A A A	22 20 25	0.49 0.25 0.00	4.82 4.82 4.82	$3\frac{1}{2}-2\frac{1}{2}$ $2\frac{1}{2}-2\frac{1}{2}$ $1\frac{1}{2}-2\frac{1}{2}$	$a^4F - 39059^\circ$ (11)
2899.03	A	15	0.49	4.75	$3\frac{1}{2}-2\frac{1}{2}$	$a^4F - \gamma^4F^\circ \dagger$	2684.27	A	18	0.25	4.85	$2\frac{1}{2}-1\frac{1}{2}$	$a^4F - 39253^\circ \dagger$ (12)
2891.84	A	30	0.25	4.52	$2\frac{1}{2}-1\frac{1}{2}$	(2)	2957.59	A	20	0.69	4.87	$4\frac{1}{2}-4\frac{1}{2}$	$a^4F - 39422^\circ$ (13)
2714.66‡	A	18	0.00	4.55	$1\frac{1}{2}-2\frac{1}{2}$	$a^4F - \gamma^4G^\circ \dagger$	2819.37	A	15	0.49	4.87	$3\frac{1}{2}-4\frac{1}{2}$	$a^4F - 39641^\circ \dagger$ (14)
2850.97	A	35	0.69	5.02	$4\frac{1}{2}-4\frac{1}{2}$	(3)	2802.06	A	20	0.49	4.89	$3\frac{1}{2}-3\frac{1}{2}$	$a^4F - 39688^\circ$ (15)
2879.73	A	15	0.49	4.77	$3\frac{1}{2}-3\frac{1}{2}$	$a^4F - 37145^\circ$	2798.40	A	18	0.49	4.90	$3\frac{1}{2}-2\frac{1}{2}$	$a^4F - 39786^\circ \dagger$ (16)
2871.40	A	25	0.25	4.55	$2\frac{1}{2}-2\frac{1}{2}$	$(4) - 37461^\circ$	2646.36	A	20	0.25	4.91	$2\frac{1}{2}-2\frac{1}{2}$	$a^4F - 39936^\circ \dagger$ (17)
2691.31	A	18	0.00	4.59	$1\frac{1}{2}-2\frac{1}{2}$	$a^4F - 37630^\circ$	2779.11	A	35	0.49	4.93	$3\frac{1}{2}-3\frac{1}{2}$	$a^4F - 40333^\circ$ (18)
2668.62	A	20	0.00	4.62	$1\frac{1}{2}-0\frac{1}{2}$	(5)	2880.00	A	20	0.69	4.98	$4\frac{1}{2}-3\frac{1}{2}$	$a^4F - 40755^\circ$ (19)
2969.47	A	20	0.49	4.65	$3\frac{1}{2}-2\frac{1}{2}$	$a^4F - 37760^\circ$	2748.77	A	20	0.49	4.98	$3\frac{1}{2}-3\frac{1}{2}$	
2806.59	A	25	0.25	4.65	$2\frac{1}{2}-2\frac{1}{2}$	(6)	2608.63	A	15	0.25	4.98	$2\frac{1}{2}-3\frac{1}{2}$	
2796.33	A	25	0.25	4.66	$2\frac{1}{2}-1\frac{1}{2}$	$a^4F - \gamma^6F^\circ \dagger$	2845.34	A	20	0.69	5.03	$4\frac{1}{2}-3\frac{1}{2}$	
2647.47	A	30	0.00	4.66	$1\frac{1}{2}-1\frac{1}{2}$	(7)	2717.18	A	15	0.49	5.03	$3\frac{1}{2}-3\frac{1}{2}$	
2661.88	A	18	0.69	5.33	$4\frac{1}{2}-3\frac{1}{2}$	(8)							
2736.24	A	20	0.25	4.76	$2\frac{1}{2}-1\frac{1}{2}$	$a^4F - 38545^\circ$ (9)							
*2873.56§	A	20	0.49	4.78	$3\frac{1}{2}-2\frac{1}{2}$	$a^4F - 38753^\circ$ (10)							
2720.74	A	12	0.25	4.78	$2\frac{1}{2}-2\frac{1}{2}$								
2579.62	A	12	0.00	4.78	$1\frac{1}{2}-2\frac{1}{2}$								
2573.54	A	18	0.00	4.80	$1\frac{1}{2}-0\frac{1}{2}$								

Ta I—Continued

I A	Ref	Int	E P		J	Multiplet No.
			Low	High		
Air						
2710.12	A	20	0.49	5.04	$3\frac{1}{2}-2\frac{1}{2}$	$a^4F -40851^\circ$
2573.80	A	15	0.25	5.04	$2\frac{1}{2}-2\frac{1}{2}$	(20)
2427.64	A	18	0.00	5.08	$1\frac{1}{2}-0\frac{1}{2}$	$a^4F -41179^\circ$
						(21)
2636.67	A	25	0.49	5.17	$3\frac{1}{2}-2\frac{1}{2}$	$a^4F -41879^\circ$
2507.45	A	15	0.25	5.17	$2\frac{1}{2}-2\frac{1}{2}$	(22)
2692.39	A	18	0.69	5.28	$4\frac{1}{2}-3\frac{1}{2}$	$a^4F -42751^\circ$
						(23)
2668.06	A	15	0.69	5.32	$4\frac{1}{2}-4\frac{1}{2}$	$a^4F -43090^\circ$
2555.07	A	10	0.49	5.32	$3\frac{1}{2}-4\frac{1}{2}$	(24)
2661.33	A	30	0.69	5.33	$4\frac{1}{2}-5\frac{1}{2}$	$a^4F -43185^\circ$
2636.90	A	30	0.69	5.37	$4\frac{1}{2}-3\frac{1}{2}$	(25) -43533°
2504.45	A	27	0.49	5.42	$3\frac{1}{2}-2\frac{1}{2}$	$a^4F -43880^\circ$
						(26)
2595.26	A	15	0.69	5.45	$4\frac{1}{2}-5\frac{1}{2}$	$a^4F -44141^\circ$
2593.09	A	15	0.69	5.45	$4\frac{1}{2}-4\frac{1}{2}$	(27) -44173°
2989.49	A	20	0.75	4.88	$0\frac{1}{2}-0\frac{1}{2}$	$a^4P -39490^\circ$
						(28)
*2874.14	A	15	0.75	5.04	$1\frac{1}{2}-2\frac{1}{2}$	$a^4P -40851^\circ$
2814.79	A	20	0.75	5.13	$1\frac{1}{2}-2\frac{1}{2}$	(29) -41684°
2806.29	A	20	0.75	5.15	$1\frac{1}{2}-1\frac{1}{2}$	-41692°
2791.67	A	20	0.75	5.17	$1\frac{1}{2}-2\frac{1}{2}$	-41879°
2718.37	A	15	0.75	5.29	$1\frac{1}{2}-2\frac{1}{2}$	(30) -42844°
2947.80	A	10	1.14	5.33	$2\frac{1}{2}-1\frac{1}{2}$	$a^4P -43167^\circ$
2694.75	A	12	0.75	5.33	$1\frac{1}{2}-1\frac{1}{2}$	(31)
2693.34	A	15	0.75	5.33	$0\frac{1}{2}-1\frac{1}{2}$	$a^4P - y^4P^\circ$
2696.80	A	15	1.14	5.72	$2\frac{1}{2}-2\frac{1}{2}$	(32)
2643.88	A	15	0.75	5.42	$1\frac{1}{2}-2\frac{1}{2}$	$a^4P -43880^\circ$
2601.05	A	15	0.75	5.49	$0\frac{1}{2}-1\frac{1}{2}$	(33) -44483°
2787.69	A	50	1.14	5.57	$2\frac{1}{2}-3\frac{1}{2}$	$a^4P -45114^\circ$
						(34)
2741.16	A	12	1.14	5.64	$2\frac{1}{2}-1\frac{1}{2}$	$a^4P -45723^\circ$
2519.78	A	12	0.75	5.64	$0\frac{1}{2}-1\frac{1}{2}$	(35)
2650.28	A	18	1.14	5.80	$2\frac{1}{2}-1\frac{1}{2}$	$a^4P -46974^\circ$
2575.47	A	15	1.14	5.93	$2\frac{1}{2}-3\frac{1}{2}$	(36) -48069°
2844.24	A	25	1.32	5.66	$4\frac{1}{2}-5\frac{1}{2}$	$a^2G - y^6F^\circ$
						(37)
2988.57	A	15	1.32	5.45	$4\frac{1}{2}-5\frac{1}{2}$	$a^2G -44141^\circ$
						(38)

Ta I—Continued

I A	Ref	Int	E P		J	Multiplet No.
			Low	High		
Air						
2900.35	A	20	1.20	5.45	$3\frac{1}{2}-4\frac{1}{2}$	$a^2G -44173^\circ$
2857.28	A	15	1.20	5.52	$3\frac{1}{2}-3\frac{1}{2}$	(39) -44693°
2781.37	A	25	1.20	5.64	$3\frac{1}{2}-3\frac{1}{2}$	-45648°
2817.50	A	15	1.32	5.70	$4\frac{1}{2}-3\frac{1}{2}$	$a^2G -46172^\circ$
2727.77	A	15	1.32	5.84	$4\frac{1}{2}-5\frac{1}{2}$	(40) -47339°
2646.21	A	25	1.32	5.98	$4\frac{1}{2}-4\frac{1}{2}$	-48468°
2599.41	A	15	1.32	6.07	$4\frac{1}{2}-4\frac{1}{2}$	-49149°
2902.04	A	18	1.65	5.90	$4\frac{1}{2}-4\frac{1}{2}$	$a^6D - x^6D^\circ$
2925.28	A	10	1.51	5.73	$3\frac{1}{2}-3\frac{1}{2}$	(41)
2939.26	A	15	1.39	5.59	$2\frac{1}{2}-2\frac{1}{2}$	
2834.40	A	15	1.23	5.59	$1\frac{1}{2}-1\frac{1}{2}$	
2876.09	A	10	1.20	5.50	$0\frac{1}{2}-0\frac{1}{2}$	
3024.08	A	10	1.65	5.73	$4\frac{1}{2}-3\frac{1}{2}$	
3027.49	A	12	1.51	5.59	$3\frac{1}{2}-2\frac{1}{2}$	
2940.10	A	18	1.39	5.59	$2\frac{1}{2}-1\frac{1}{2}$	
2894.15	A	12	1.23	5.50	$1\frac{1}{2}-0\frac{1}{2}$	
2810.90	A	20	1.51	5.90	$3\frac{1}{2}-4\frac{1}{2}$	
2842.80	A	20	1.39	5.73	$2\frac{1}{2}-3\frac{1}{2}$	
2833.62	A	15	1.23	5.59	$1\frac{1}{2}-2\frac{1}{2}$	
2796.55	A	15	1.23	5.64	$1\frac{1}{2}-1\frac{1}{2}$	$a^6D -45723^\circ$
						(42)
2686.29	A	15	1.20	5.80	$0\frac{1}{2}-1\frac{1}{2}$	$a^6D -46974^\circ$
						(43)
2941.36	A	15	1.65	5.84	$4\frac{1}{2}-5\frac{1}{2}$	$a^6D -47339^\circ$
						(44)
2789.77	A	20	1.51	5.93	$3\frac{1}{2}-3\frac{1}{2}$	$a^6D -48069^\circ$
						(45)
2914.12	A	20	1.35	5.59	$1\frac{1}{2}-2\frac{1}{2}$	$a^2P - x^6D^\circ$
2781.79	A	15	1.35	5.79	$1\frac{1}{2}-1\frac{1}{2}$	(46) -46887°
2775.11	A	15	1.35	5.80	$1\frac{1}{2}-1\frac{1}{2}$	-46974°
2864.49	A	15	1.87	6.17	$5\frac{1}{2}-4\frac{1}{2}$	$a^2H -50014^\circ$
						(47)
2889.37	A	15	2.15	6.42	$3\frac{1}{2}-3\frac{1}{2}$	$a^2F -51982^\circ$
						(48)
*2874.14	A	15	2.43	6.72	$1\frac{1}{2}-1\frac{1}{2}$	$z^4D^\circ - f^4F$
						(49)
2821.98	A	15	3.25	7.63	$1\frac{1}{2}-1\frac{1}{2}$	$y^4D^\circ -61789$
						(50)

Ta II

I P 16 Anal A List C April 1961

REFERENCE

A C. C. Kiess, J. Research Nat. Bur. Std. 66A3 (1962). T, C L, W L, I
 * and §=Blend of Ta I and Ta II

Ta II

Ta II

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Air							Air						
2965.93	A	50	0.00	4.16	1-1	$a^5F -33706^\circ$	2957.88	A	50	1.20	5.38	4-3	$a^3F -43544^\circ$
2965.14	A	250	0.00	4.16	1-2	(1) -33715°	*2866.14	A	35	1.20	5.51	4-4	(8) -44626°
2702.78	A	35	0.00	4.57	1-1	-36987°	2735.26	A	50	1.20	5.72	4-5	-46295°
*2685.16	A	150	0.00	4.60	1-2	-37230°	*2709.27	A	125	1.20	5.76	4-4	-46645°
2595.58	A	50	0.00	4.75	1-2	-38515°							
2844.46	A	200	0.13	4.47	2-2	$a^5F -36177^\circ$							
*2797.76	A	200	0.13	4.54	2-3	(2) -36763°	2905.24	A	100	0.51	4.76	0-1	$a^3P -38535^\circ$
2780.34	A	50	0.13	4.57	2-1	-36987°	*2685.16	A	150	0.51	5.11	0-1	(9) -41355°
2761.65	A	75	0.13	4.60	2-2	-37230°							
2665.60	A	50	0.13	4.76	2-1	-38535°	2881.60	A	50	0.66	4.94	1-0	$a^3P -40023^\circ$
2635.59	A	200	0.13	4.81	2-3	-38962°	2858.43	A	125	0.66	4.98	1-1	(10) -40304°
2612.62	A	50	0.13	4.85	2-3	-39295°	2791.37	A	50	0.66	5.08	1-2	-41144°
2545.50	A	75	0.13	4.98	2-1	-40304°							
2182.72	A	50	0.13	5.78	2-3	-46831°	2885.40	A	40	0.70	4.98	2-1	$a^3P -40304^\circ$
							2817.10	A	200	0.70	5.08	2-2	(11) -41144°
2986.81	A	50	0.33	4.46	3-4	$a^5F -36112^\circ$	2784.96	A	75	0.70	5.13	2-3	-41554°
*2890.26	A	50	0.33	4.60	3-2	(3) -37230°	2739.26	A	75	0.70	5.20	2-2	-42153°
2752.49	A	100	0.33	4.81	3-3	-38962°	2680.06	A	75	0.70	5.30	2-3	-42959°
2727.44	A	75	0.33	4.85	3-3	-39295°	2672.50	A	50	0.70	5.32	2-2	-43064°
2694.52	A	100	0.33	4.91	3-4	-39743°	2526.03	A	50	0.70	5.58	2-1	-45233°
2659.40	A	40	0.33	4.97	3-2	-40233°							
2596.46	A	75	0.33	5.08	3-2	-41144°							
*2569.13	A	40	0.33	5.13	3-3	-41554°							
2554.63	A	50	0.33	5.16	3-4	-41775°	2953.00	A	100	1.20	5.38	2-3	$b^3F -43544^\circ$
2532.13	A	100	0.33	5.20	3-4	-42122°	2877.67	A	100	1.20	5.48	2-3	(12) -44430°
2381.14	A	50	0.33	5.51	3-4	-44626°	2557.71	A	50	1.20	6.02	2-1	-48776°
2227.85	A	50	0.33	5.87	3-2	-47514°	2537.96	A	75	1.20	6.06	2-2	-49080°
							2501.99	A	50	1.20	6.13	2-3	-49646°
*2866.14	A	35	0.55	4.85	4-3	$a^5F -39295^\circ$							
2829.79	A	30	0.55	4.91	4-4	(4) -39743°	2949.92	A	70	1.80	5.98	3-4	$b^3F -48470^\circ$
2680.66	A	75	0.55	5.15	4-5	-41709°	2850.98	A	40	1.80	6.13	3-3	(13) -49646°
2675.90	A	100	0.55	5.16	4-4	-41775°	*2579.06	A	40	1.80	6.59	3-4	-53343°
2651.23	A	125	0.55	5.20	4-4	-42122°	2421.85	A	50	1.80	6.90	3-2	-55859°
2593.68	A	50	0.55	5.30	4-3	-42959°							
2387.09	A	50	0.55	5.72	4-5	-46295°	2811.70	A	125	2.28	6.67	4-5	$b^3F -54048^\circ$
2196.05	A	50	0.55	6.16	4-4	-49937°	2799.27	A	35	2.28	6.69	4-4	(14) -54206°
							*2633.78	A	75	2.28	6.97	4-5	-56450°
2814.30	A	90	0.76	5.15	5-5	$a^5F -41709^\circ$	2628.84	A	50	2.28	6.98	4-5	-56521°
2603.49	A	125	0.76	5.50	5-5	(5) -44585°							
2470.90	A	50	0.76	5.76	5-4	-46645°							
2432.71	A	75	0.76	5.84	5-4	-47280°							
2400.62†	A	100	0.76	5.90	5-6	-47829°	2819.13	A	70	1.32	5.70	1-1	$a^5P -46174^\circ$
2364.26	A	40	0.76	5.98	5-4	-48470°							
2332.00	A	35	0.76	6.06	5-5	-49055°	2798.72	A	40	1.47	5.88	2-1	$a^5P -47595^\circ$
2142.52	A	40	0.76	6.52	5-6	-52846°	2481.87	A	30	1.47	6.44	2-1	(16) -52155°
2827.59	A	60	0.39	4.76	2-1	$a^3F -38535^\circ$	*2579.06	A	40	1.54	6.32	3-2	$a^5P -51197^\circ$
2476.69	A	40	0.39	5.38	2-3	(6) -43544°	2463.83	A	50	1.54	6.54	3-2	(17) -53010°
2879.09	A	35	0.84	5.13	3-3	$a^3F -41554^\circ$							
2860.88	A	75	0.84	5.16	3-4	(7) -41775°							
2832.70	A	50	0.84	5.20	3-4	-42122°							
2689.27	A	50	0.84	5.43	3-4	-44005°							
2658.86	A	75	0.84	5.48	3-3	-44430°							

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Air							Air						
2968.29	A	75	1.45	5.61	3-2	<i>a</i> ³ G -45446°	2838.23	A	175	1.96	6.31	4-3	<i>a</i> ³ H -51073°
*2709.27	A	125	1.45	6.01	3-2	(18) -48666°	2606.43	A	100	1.96	6.69	4-4	(30) -54206°
2639.19	A	40	1.45	6.13	3-3	-49646°	2468.42	A	40	1.96	6.96	4-3	-56351°
2976.99	A	50	1.57	5.71	4-4	<i>a</i> ³ G -46286°	*2978.20	A	50	2.25	6.39	5-5	<i>a</i> ³ H -51753°
2976.22	A	200	1.57	5.72	4-5	(19) -46295°	2852.34	A	150	2.25	6.57	5-5	(31) -53231°
2900.74	A	75	1.57	5.82	4-3	-47168°	2843.51	A	110	2.25	6.59	5-4	-53343°
2795.20	A	70	1.57	5.98	4-4	-48470°	2678.81	A	50	2.25	6.85	5-5	-55505°
2757.26	A	40	1.57	6.04	4-3	-48962°	*2633.78	A	75	2.25	6.93	5-4	-56142°
2658.14	A	50	1.57	6.21	4-3	-50314°	2598.19	A	75	2.25	7.00	5-6	-56662°
2644.58	A	100	1.57	6.24	4-5	-50507°	2475.32	A	50	2.25	7.23	5-5	-58572°
2578.25	A	40	1.57	6.36	4-4	-51479°							
2901.87	A	50	1.58	5.84	5-4	<i>a</i> ³ G -47280°	2867.41	A	150	2.22	6.52	6-6	<i>a</i> ³ H -52846°
						(20) -47280°	2771.82	A	75	2.22	6.67	6-5	(32) -54048°
							2664.25	A	75	2.22	6.85	6-5	-55505°
							*2584.49	A	75	2.22	7.00	6-6	-56662°
2856.68	A	50	1.56	5.88	0-1	<i>a</i> ⁵ D -47595°							
						(21) -47595°	*2944.57	A	50	2.14	6.34	1-1	<i>b</i> ³ P -51326°
*2936.95	A	50	1.66	5.87	1-2	<i>a</i> ⁵ D -47514°	2381.55	A	40	2.14	7.33	1-2	(33) -59351°
2912.41	A	40	1.66	5.90	1-0	(22) -47801°							
*2890.26	A	50	1.66	5.93	1-0	-48064°	2969.04	A	40	2.85	7.01	4-4	<i>c</i> ³ F -56753°
*2584.49	A	75	1.66	6.44	1-1	-52155°	*2730.74	A	50	2.85	7.37	4-5	(34) -59692°
2999.38	A	125	1.79	5.90	2-3	<i>a</i> ⁵ D -47825°							
2964.02	A	50	1.79	5.95	2-2	(23) -48223°							
2956.84	A	100	1.94	6.12	3-3	<i>a</i> ⁵ D -49536°	*2730.74	A	50	3.46	7.98	2-3	<i>c</i> ³ P -64653°
2951.90	A	75	1.94	6.12	3-2	(24) -49592°							(35)
2922.13	A	40	1.94	6.16	3-4	-49937°							
2746.83	A	75	1.94	6.43	3-3	-52121°							
2918.96	A	200	2.13	6.36	4-4	<i>a</i> ⁵ D -51479°	*2569.13	A	40	2.89	7.69	1-2	<i>a</i> ¹ P -62317°
2865.32	A	85	2.13	6.43	4-3	(25) -52121°							(36)
2544.37	A	75	2.13	6.98	4-5	-56521°							
2974.54	A	50	1.67	5.82	2-3	<i>a</i> ¹ D -47168°	2710.73	A	40	2.99	7.54	5-4	<i>a</i> ¹ H -61105°
*2917.56	A	50	1.67	5.90	2-3	(26) -47825°	2675.73	A	50	2.99	7.60	5-6	(37) -61588°

TUNGSTEN, $Z = 74$

W I

I P 7.95 Anal B List C March 1956

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 O. Laporte and J. E. Mack, Phys. Rev. 63, 246 (1943). I P

W I

W I

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Air							Air						
2910.997	A	100	0.00	4.24	0-1	$a^5D -34342^\circ$	2770.880	A	200R	0.36	4.82	3-2	$a^7S -39030^\circ$
2879.396	A	140R	0.00	4.29	0-1	(1) -34719°	2724.352	A	300R	0.36	4.89	3-3	(6) -39646°
2762.339	A	150	0.00	4.47	0-1	-36190°	*2719.858	A	50	0.36	4.90	3-2	-39707°
2606.388	A	35R	0.00	4.74	0-1	-38355°	2718.906	A	250R	0.36	4.90	3-4	-39719°
2551.349	A	200R	0.00	4.84	0-1	-39183°	2697.514	A	60	0.36	4.94	3-2	-40011°
2451.996	A	50R	0.00	5.03	0-1	-40770°	2681.422	A	400R	0.36	4.97	3-4	-40233°
2313.170	A	30R	0.00	5.34	0-1	-43217°	2678.878	A	150	0.36	4.97	3-3	-40269°
2277.583	A	60R	0.00	5.42	0-1	-43892°	*2656.540	A	300R	0.36	5.01	3-4	-40583°
2253.910	A	25R	0.00	5.48	0-1	-44353°	2632.695	A	40R	0.36	5.05	3-3	-40923°
							2613.818	A	50R	0.36	5.09	3-4	-41198°
							2580.337	A	30R	0.36	5.15	3-3	-41694°
2934.996	A	250R	0.21	4.41	1-2	$a^5D -35731^\circ$	2997.793	A	75	0.41	4.53	2-2	$a^5D -36673^\circ$
2896.009	A	150R	0.21	4.47	1-1	(2) -36190°	2979.860	A	70R	0.41	4.55	2-3	(7) -36874°
2863.012	A	50	0.21	4.52	1-0	-36588°	2928.194	A	50	0.41	4.63	2-2	-37466°
2856.030	A	150R	0.21	4.53	1-2	-36673°	2910.483	A	100	0.41	4.65	2-3	-37674°
2837.345	A	60	0.21	4.56	1-2	-36904°	2878.721	A	50	0.41	4.70	2-3	-38053°
2768.982	A	100	0.21	4.66	1-1	-37773°	2866.062	A	200R	0.41	4.72	2-3	-38206°
*2725.062	A	60	0.21	4.74	1-1	-38355°	2799.928	A	50	0.41	4.82	2-2	-39030°
2675.867	A	60c	0.21	4.82	1-2	-39030°	2787.984	A	50	0.41	4.84	2-1	-39183°
2664.966	A	100c	0.21	4.84	1-1	-39183°	*2725.033	A	60	0.41	4.94	2-2	-40011°
2633.129	A	75R	0.21	4.89	1-1	-39636°	2706.017	A	50Fe?	0.41	4.97	2-3	-40269°
2607.378	A	35R	0.21	4.94	1-2	$a^5D -40011^\circ$	2695.670	A	150R	0.41	4.99	2-1	$a^5D -40411^\circ$
2580.487	A	125R	0.21	4.99	1-1	(3) -40411°	2677.276	A	100R	0.41	5.02	2-3	(8) -40665°
2556.749	A	40R	0.21	5.03	1-1	-40770°	2662.835	A	200R	0.41	5.05	2-2	-40868°
2533.635	A	35R	0.21	5.08	1-0	-41127°	2646.185	A	70	0.41	5.07	2-2	-41104°
2504.698	A	60R	0.21	5.13	1-2	-41583°	2613.076	A	80R	0.41	5.13	2-2	-41583°
2495.264	A	50R	0.21	5.15	1-2	-41734°	2547.136	A	100R	0.41	5.26	2-1	-42573°
2480.955	A	30R	0.21	5.18	1-0	-41965°	2545.340	A	50R	0.41	5.26	2-3	-42601°
2480.130	A	50R	0.21	5.18	1-2	-41978°	2489.720	A	35R	0.41	5.37	2-3	-43478°
2462.793	A	50R	0.21	5.22	1-1	-42262°	2466.848	A	50R	0.41	5.41	2-3	-43850°
*2451.484§	A	35R	0.21	5.24	1-2	-42449°	2464.305	A	30R	0.41	5.42	2-1	-43892°
2444.056	A	60R	0.21	5.26	1-1	$a^5D -42573^\circ$	2459.300	A	70R	0.41	5.43	2-2	-43975°
2415.685	A	35R	0.21	5.31	1-0	(4) -43053°	2456.534	A	75R	0.41	5.43	2-3	$a^5D -44021^\circ$
2405.580	A	30R	0.21	5.34	1-2	-43227°	2414.039	A	20R	0.41	5.52	2-1	(9) -44737°
2260.10	A	35R	0.21	5.67	1-2	-45902°	2326.698	A	15R	0.41	5.71	2-1	-46291°
2201.504	A	60	0.21	5.81	1-2	-47079°	2321.629	A	40R	0.41	5.73	2-3	-46385°
2146.43	A	35R	0.21	5.96	1-2	-48244°	2263.880	A	35R	0.41	5.86	2-3	-47483°
2121.60	A	200R?	0.21	6.02	1-1	$-48788^\circ?$	2229.196	A	50	0.41	5.95	2-3	-48170°
2105.394	A	50	0.21	6.07	1-2	-49151°	2225.544	A	100	0.41	5.96	2-2	-48244°
2964.520	A	150	0.36	4.53	3-2	$a^7S -36673^\circ$	2175.842	A	80R	0.41	6.08	2-2	-49270°
2946.989	A	500R	0.36	4.55	3-3	(5) -36874°	2164.340	A	25R	0.41	6.11	2-3	-49514°
2944.398	A	500R	0.36	4.56	3-2	-36904°	2109.31	A	60	0.41	6.26	2-2	-50718°
2923.539	A	60	0.36	4.59	3-4	-37146°							$a^5D -38206^\circ$
2896.442	A	400R	0.36	4.63	3-2	-37466°	2995.258	A	60	0.60	4.72	3-3	
2879.112	A	150R	0.36	4.65	3-3	-37674°	2947.388	A	150R?	0.60	4.78	3-4	
2848.022	A	180R	0.36	4.70	3-3	-38053°	2923.103	A	150	0.60	4.82	3-2	
2835.638	A	60	0.36	4.72	3-3	-38206°	2841.570	A	80R	0.60	4.94	3-2	
2831.379	A	150R	0.36	4.72	3-4	-38259°	2773.999	A	200R	0.60	5.05	3-2	
2792.696	A	60R	0.36	4.78	3-4	-38748°	2769.741	A	80	0.60	5.05	3-3	
							2748.844	A	80c	0.60	5.09	3-4	
							2708.927	A	80	0.60	5.15	3-2	
							2698.844	A	80	0.60	5.17	3-4	

W I—Continued

W I—Continued

I A	Ref	Int	E P		J	Multiplet No.		I A	Ref	Int	E P		J	Multiplet No.	
			Low	High							Low	High			
Air								Air							
2691.094	A	100	0.60	5.18	3-2	a ⁵ D	-41978°	2972.922	A	50	1.50	5.65	4-5	a ³ H	-45789°
2671.472	A	200R	0.60	5.22	3-3	(11)	-42251°	*2881.606	A	80	1.50	5.78	4-5	(18)	-46854°
2657.361	A	60	0.60	5.24	3-4		-42450°	2791.961	A	80	1.50	5.92	4-4		-47968°
2625.220	A	60R	0.60	5.30	3-4		-42910°	2700.012	A	100R?	1.50	6.07	4-5		-49187°
2603.544	A	40R	0.60	5.34	3-2		-43227°	2683.347	A	100	1.50	6.10	4-3		-49417°
2601.963	A	40R	0.60	5.34	3-4		-43251°	2632.485	A	30R	1.50	6.19	4-5		-50137°
2561.968	A	50R	0.60	5.41	3-3		-43850°	2484.741	A	40R	1.50	6.47	4-5		-52395°
2553.824	A	100R	0.60	5.43	3-2		-43975°	2482.212	A	16R	1.50	6.47	4-4		-52436°
2553.168	A	70c	0.60	5.43	3-4		-43986°	2448.390	A	25R	1.50	6.54	4-4		-52992°
								2331.292	A	30R	1.50	6.80	4-4		-55043°
2528.486	A	50R	0.60	5.48	3-2	a ⁵ D	-44367°								
2523.410	A	30R	0.60	5.49	3-3	(12)	-44447°	2960.146	A	60	1.64	5.81	1-2	a ³ P	-47079°
2487.495	A	25R	0.60	5.56	3-2		-45019°	2747.005	A	50	1.64	6.14	1-2	(19)	-49699°
2472.506	A	35R	0.60	5.59	3-4		-45262°								
2454.978	A	40R	0.60	5.62	3-3		-45551°	2829.821	A	50	1.65	6.01	3-4	a ³ G	-48676°
2435.957	A	40R	0.60	5.66	3-4		-45869°	2771.628	A	50	1.65	6.10	3-3	(20)	-49417°
2433.982	A	25R	0.60	5.67	3-2		-45902°	2743.426	A	50	1.65	6.15	3-4		-49788°
2424.206	A	40R	0.60	5.69	3-3		-46068°	2706.579	A	100Fe?	1.65	6.21	3-4		-50284°
2405.689	A	20R	0.60	5.73	3-3		-46385°	2691.289	A	70	1.65	6.23	3-2		-50494°
2374.468	A	30R	0.60	5.79	3-4	a ⁵ D	-46931°	2969.618	A	60	1.70	5.86	2-2	a ³ F	-47442°
2306.593	A	35R	0.60	5.95	3-3	(13)	-48170°	*2719.858	A	50	1.70	6.24	2-1	(21)	-50533°
2227.98	A	80R	0.60	6.14	3-2		-49699°								
2223.574	A	80R	0.60	6.15	3-4		-49788°	2857.145	A	50	1.85	6.17	2-3	a ³ P	-49966°
2214.830	A	40	0.60	6.17	3-3		-49966°								
2199.300	A	50	0.60	6.21	3-4		-50284°	2708.592	A	100Fe?	1.86	6.42	5-6	a ³ H	-51978°
2178.474	A	80R	0.60	6.26	3-2		-50718°	2560.124	A	40R	1.86	6.68	5-4	(23)	-54118°
2174.620	A	60	0.60	6.27	3-3		-50800°	2520.455	A	50	1.86	6.76	5-6		-54733°
2169.474	A	100R	0.60	6.28	3-4		-50909°	2241.282	A	50	1.86	7.37	5-5		-59673°
2993.614	A	125R	0.77	4.89	4-5	a ⁵ D	-39614°	2853.502	A	50	1.91	6.23	3-2	a ³ F	-50494°
2990.714	A	50	0.77	4.89	4-3	(14)	-39646°	2663.556	A	50c	1.91	6.54	3-4	(24)	-52992°
2939.047	A	30R	0.77	4.97	4-4		-40233°	2654.659	A	60c	1.91	6.56	3-4		-53118°
2918.254	A	100	0.77	5.00	4-5		-40476°								
*2881.606	A	80	0.77	5.05	4-5		-40911°	2719.331	A	50	2.03	6.57	4-5	a ³ G	-53194°
2858.042	A	60	0.77	5.09	4-4		-41198°	2708.188	A	50c	2.03	6.59	4-3	(25)	-53345°
2833.630	A	120R	0.77	5.12	4-3		-41499°	2652.592	A	50c	2.03	6.68	4-4		-54118°
2818.060	A	250R	0.77	5.15	4-3		-41694°								
2774.476	A	300R	0.77	5.22	4-3		-42251°	2680.046	A	60	2.10	6.70	6-5	a ³ H	-54310°
2715.503	A	75	0.77	5.31	4-5		-43034°	2584.386	A	70R	2.10	6.88	6-7	(26)	-55690°
								2214.340	A	50	2.10	7.67	6-5		-62154°
2699.594	A	150R	0.77	5.34	4-4	a ⁵ D	-43251°	*2719.858	A	50	2.11	6.65	4-5	a ³ F	-53862°
*2664.321§	A	80c	0.77	5.40	4-5	(15)	-43741°								
*2656.540	A	300R	0.77	5.41	4-3		-43850°	2765.642	A	50c	2.19	6.65	3-4	a ¹ F	-53848°
2615.124	A	40R	0.77	5.49	4-3		-44447°								
2608.320	A	50R	0.77	5.50	4-5		-44546°	2687.369	A	80	2.34	6.93	3-4	a ⁵ G	-56174°
2521.323	A	50R	0.77	5.66	4-4		-45869°								
2481.440	A	80R	0.77	5.74	4-5		-46506°	2668.473	A	50c	2.38	7.00	2-3	a ³ D	-56717°
2474.149	A	70R	0.77	5.76	4-4		-46625°								
2460.160	A	25R	0.77	5.78	4-5		-46854°	2735.975	A	50	2.38	6.89	4-5	a ⁵ G	-55795°
2455.506	A	40R	0.77	5.79	4-4		-46931°	2721.650	A	50	2.38	6.91	4-5	(31)	-55987°
2384.824	A	20R	0.77	5.94	4-5		-48138°	2707.877	A	80	2.38	6.93	4-4		-56174°
2382.990	A	20R	0.77	5.95	4-3	a ⁵ D	-48170°								
2326.564	A	25R	0.77	6.07	4-5	(16)	-49187°	2780.285	A	60	2.41	6.85	5-5	a ⁵ G	-55492°
2314.174	A	20R	0.77	6.10	4-3		-49417°	2722.456	A	50	2.41	6.94	5-4	(32)	-56255°
2309.018	A	25R	0.77	6.11	4-3		-49514°	2702.524	A	50	2.41	6.98	5-6		-56526°
2294.494	A	80R	0.77	6.15	4-4		-49788°								
2285.17	A	100R	0.77	6.17	4-3		-49966°	2977.106	A	60	2.43	6.57	6-6	a ⁵ G	-53228°
2202.856	A	50	0.77	6.37	4-3		-51600°	2773.702	A	80	2.43	6.88	6-7	(33)	-55690°
2182.90	A	150R	0.77	6.42	4-3		-52015°								
2179.764	A	100R	0.77	6.43	4-5		-52081°	2937.142	A	60	2.45	6.65	5-5	a ³ G	-53862°
2164.928	A	25R	0.77	6.47	4-5		-52395°								
2128.122	A	50	0.77	6.57	4-5		-53194°								
2909.120	A	50	1.18	5.42	0-1	a ³ P	-43892°	2767.144	A	50	2.45	6.91	3-4	a ³ D	-55955°
2839.340	A	50	1.18	5.52	0-1	(17)	-44737°	2936.009	A	50	2.59	6.79	2-2	20983	-55032°
2733.178	A	50	1.18	5.69	0-1		-46104°						(36)		

W I—Continued

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Strongest Unclassified Lines of W 1													
Air							Air						
2915.587	A	50					2230.734	A	50				
2869.117	A	50					2212.170	A	75				
2844.922	A	50					2198.367	A	150				
2705.174	A	60					2197.080	A	80				
2674.692	A	50c					2192.36	A	60				
2585.235	A	50					2110.33	A	60				
2527.763	A	40R					2101.538	A	100				
2519.874	A	50					2099.85	A	50				
2395.476	A	30R					2090.477	A	60				
2374.154	A	25R					2087.10	A	80				
2246.77	A	45R											

W II

I P 18? Anal B List B July 1956

REFERENCES

A D. D. Laun, J. Research Nat. Bur. Std. 21, 207, RP1125 (1938) and unpublished material (March 1956).

W L, I, T

W. Finkelburg und W. Humbach, Naturwiss. 42, 35 (1935). I P

* and §=Blend of W II and W I

W II

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Air							Air						
2764.263	A	400	0.00	4.46	0½-0½	a ⁶ D -36165°	2677.796	A	60	0.58	5.19	3½-2½	a ⁶ D -42049°
2554.864	A	60	0.00	4.83	0½-1½	(1) -39129°	2653.568	A	35	0.58	5.23	3½-3½	(4) -42390°
*2248.750 §	A	100	0.00	5.49	0½-0½	-44455°	2522.039	A	80	0.58	5.48	3½-2½	-44354°
2225.882	A	150	0.00	5.54	0½-1½	-44911°	*2496.648 §	A	120	0.58	5.53	3½-4½	-44758°
2194.515	A	50	0.00	5.62	0½-1½	-45553°?	2489.231	A	200	0.58	5.54	3½-3½	-44877°
Vac							2392.932	A	60	0.58	5.74	3½-4½	-46493°
1951.06	A	40	0.00	6.33	0½-1½	-51254°	2341.368	A	35	0.58	5.85	3½-2½	-47413°
1901.325	A	30	0.00	6.49	0½-0½	-52593°	2294.55	A	35	0.58	5.96	3½-2½	-48284°
Air							2266.12	A	80	0.58	6.03	3½-3½	-48830°
2697.714	A	160	0.19	4.76	1½-0½	a ⁶ D -38576°	*2251.14 §	A	40	0.58	6.06	3½-3½	-49124°
2658.036	A	100	0.19	4.83	1½-1½	(2) -39192°	2248.270	A	40	0.58	6.07	3½-4½	-49181°
*2466.522	A	80	0.19	5.19	1½-2½	-42049°	2245.19	A	40	0.58	6.08	3½-2½	-49242°
*2451.468 §	A	50d?	0.19	5.22	1½-1½	-42298°	*2193.440	A	40	0.58	6.21	3½-2½	-50292°
2333.770	A	35	0.19	5.48	1½-2½	-44354°	2166.316	A	80	0.58	6.28	3½-4½	-50863°
2328.314	A	35	0.19	5.49	1½-0½	-44455°	2065.57	A	30	0.58	6.56	3½-2½	-53113°
2303.819	A	75	0.19	5.54	1½-1½	-44911°	2053.670	A	50	0.58	6.59	3½-4½	-53369°
*2270.232	A	125	0.19	5.62	1½-1½	-45553°	2026.07	A	30	0.58	6.67	3½-4½	-54056°
2229.620	A	100	0.19	5.72	1½-2½	-46355°	2008.08	A	40	0.58	6.73	3½-3½	-54498°
2189.364	A	40	0.19	5.82	1½-1½	-47179°	2589.171	A	90	0.76	5.53	4½-4½	a ⁶ D -44758°
*2169.936	A	40	0.19	5.87	1½-1½	-47588°	2581.206	A	30	0.76	5.54	4½-3½	(5) -44877°
2571.459	A	150	0.39	5.19	2½-2½	a ⁶ D -42049°	2497.480	A	75	0.76	5.70	4½-3½	-46175°
2555.106	A	100	0.39	5.22	2½-1½	(3) -42298°	2477.796	A	200	0.76	5.74	4½-4½	-46493°
2427.493	A	40	0.39	5.48	2½-2½	-44354°	2326.091	A	60	0.76	6.06	4½-3½	-49124°
2397.097	A	200	0.39	5.54	2½-3½	-44877°	2235.64	A	30	0.76	6.28	4½-4½	-50863°
2315.022	A	50	0.39	5.72	2½-2½	-46355°	2226.56	A	60	0.76	6.30	4½-3½	-51045°
2250.730	A	50	0.39	5.87	2½-1½	-47588°	2204.482 †	A	300	0.76	6.36	4½-5½	-51495°
2216.023	A	40	0.39	5.96	2½-2½	-48284°	2186.738	A	40	0.76	6.40	4½-3½	-51863°
2189.494	A	60	0.39	6.03	2½-3½	-48830°	2138.133	A	30	0.76	6.53	4½-3½	-52901°?
2182.225	A	40	0.39	6.05	2½-1½	-48982°	*2079.108	A	80	0.76	6.69	4½-5½	-54229°
*2169.936	A	40	0.39	6.08	2½-2½	-49242°	2067.52	A	30	0.76	6.73	4½-3½	-54498°
*2079.108	A	80	0.39	6.33	2½-1½	-51254°	2048.03	A	30	0.76	6.78	4½-5½	-54958°
2071.193	A	40	0.39	6.35	2½-2½	-51438°	2029.99	A	50	0.76	6.84	4½-4½	-55392°
2035.87	A	40	0.39	6.45	2½-3½	-52275°	*2886.923	A	35	0.92	5.19	2½-2½	a ⁶ S -42049°
2001.70	A	30	0.39	6.56	2½-2½	-53113°	2666.493	A	60	0.92	5.54	2½-1½	(6) -44911°
Vac							2579.542	A	100d	0.92	5.70	2½-3½	-46175°
1962.14	A	40	0.39	6.68	2½-1½	-54137°	2567.620	A	30	0.92	5.72	2½-2½	-46355°
1948.35	A	30	0.39	6.73	2½-3½	-54498°	2499.692	A	100	0.92	5.85	2½-2½	-47413°
							2488.780	A	120	0.92	5.87	2½-1½	-47588°
							2446.394	A	120	0.92	5.96	2½-2½	-48284°
							2390.371	A	75	0.92	6.08	2½-2½	-49242°
							*2177.546	A	30	0.92	6.58	2½-1½	-53329°

RHENIUM, $Z = 75$

Re I

I P 7.84 Anal A List B July 1956

REFERENCES

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See, also, W. F. Meggers, J. Research Nat. Bur. Std.. **49**, 187, RP2355 (1952). W L, I

Re I

Re I

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Air							Air						
2896.012	A	60R	0.00	4.26	$2\frac{1}{2}-3\frac{1}{2}$	$a^6S - z^6D^\circ$	2085.594	A	200R	0.00	5.92	$2\frac{1}{2}-3\frac{1}{2}$	$a^6S - y^6F^\circ$
2992.363	A	150R	0.00	4.12	$2\frac{1}{2}-2\frac{1}{2}$	(1)							(11)
3067.398	A	200r	0.00	4.02	$2\frac{1}{2}-1\frac{1}{2}$								
2647.128	A	30R	0.00	4.66	$2\frac{1}{2}-3\frac{1}{2}$	$a^6S - z^6F^\circ$	2198.914	A	200R	0.00	5.61	$2\frac{1}{2}-3\frac{1}{2}$	$a^6S - 45462^\circ$
2559.076	A	20R	0.00	4.82	$2\frac{1}{2}-2\frac{1}{2}$	(2)	2176.206	A	200R	0.00	5.67	$2\frac{1}{2}-3\frac{1}{2}$	(12) -45937°
							2167.938	A	200R	0.00	5.69	$2\frac{1}{2}-2\frac{1}{2}$	-46112°
2834.608	A	15	0.00	4.35	$2\frac{1}{2}-2\frac{1}{2}$	$a^6S - z^4P^\circ$	2156.673	A	100R	0.00	5.72	$2\frac{1}{2}-3\frac{1}{2}$	-46352°
2636.637	A	100R	0.00	4.68	$2\frac{1}{2}-1\frac{1}{2}$	(3)	2142.97	A	20r	0.00	5.76	$2\frac{1}{2}-2\frac{1}{2}$	-46649°
							2097.122	A	100R	0.00	5.88	$2\frac{1}{2}-3\frac{1}{2}$	-47669°
2595.234	A	60R	0.00	4.76	$2\frac{1}{2}-3\frac{1}{2}$	$a^6S - z^6G^\circ \dagger$	2092.24	A	50r	0.00	5.90	$2\frac{1}{2}-1\frac{1}{2}$	-47779°
2674.339	A	200R	0.00	4.61	$2\frac{1}{2}-2\frac{1}{2}$	(4)							
2651.903	A	100R	0.00	4.65	$2\frac{1}{2}-2\frac{1}{2}$	$a^6S - 37697^\circ$	2083.925	A	40r	0.00	5.92	$2\frac{1}{2}-2\frac{1}{2}$	$a^6S - 47970^\circ$
2520.009	A	50r	0.00	4.90	$2\frac{1}{2}-2\frac{1}{2}$	-39670°	2074.70	A	20r	0.00	5.95	$2\frac{1}{2}-3\frac{1}{2}$	(13) -48184°
2449.710	A	60r	0.00	5.04	$2\frac{1}{2}-1\frac{1}{2}$	-40808°	2049.079	A	400R	0.00	6.02	$2\frac{1}{2}-3\frac{1}{2}$	-48786°
							2039.204	A	50r	0.00	6.05	$2\frac{1}{2}-2\frac{1}{2}$	-49022°
2508.991	A	200R	0.00	4.92	$2\frac{1}{2}-3\frac{1}{2}$	$a^6S - y^6P^\circ$	2038.99	A	30r	0.00	6.05	$2\frac{1}{2}-3\frac{1}{2}$	-49027°
2294.486	A	400R	0.00	5.38	$2\frac{1}{2}-2\frac{1}{2}$	(6)	2017.866	A	200R	0.00	6.12	$2\frac{1}{2}-2\frac{1}{2}?$	-49540°
2287.506	A	400R	0.00	5.40	$2\frac{1}{2}-1\frac{1}{2}$		2016.56	A	20r	0.00	6.12	$2\frac{1}{2}-2\frac{1}{2}$	-49573°
							2003.532	A	50R	0.00	6.16	$2\frac{1}{2}-1\frac{1}{2}$	-49895°
2441.47	A	100R	0.00	5.05	$2\frac{1}{2}-3\frac{1}{2}$	$a^6S - y^6D^\circ$	Vac						
2419.807	A	100r	0.00	5.10	$2\frac{1}{2}-2\frac{1}{2}$	(7)	1995.61	A	(20R)	0.00	6.19	$2\frac{1}{2}-2\frac{1}{2}$	$a^6S - 50110^\circ$
2405.602	A	200r	0.00	5.13	$2\frac{1}{2}-1\frac{1}{2}$		1963.38	A	(15R)	0.00	6.29	$2\frac{1}{2}-2\frac{1}{2}$	(14) -50934°
							1927.72	A	(15r)	0.00	6.40	$2\frac{1}{2}-1\frac{1}{2}$	-51874°
2428.576	A	300R	0.00	5.08	$2\frac{1}{2}-3\frac{1}{2}$	$a^6S - 41163^\circ$	1909.36	A	(50R)	0.00	6.47	$2\frac{1}{2}-3\frac{1}{2}$	-52373°
2389.110	A	20r	0.00	5.17	$2\frac{1}{2}-3\frac{1}{2}$	(8) -41843°	1905.74	A	(50R)	0.00	6.48	$2\frac{1}{2}-2\frac{1}{2}$	-52472°
2365.90	A	150R	0.00	5.22	$2\frac{1}{2}-1\frac{1}{2}$	-42254°	1900.83	A	(50R)	0.00	6.49	$2\frac{1}{2}-3\frac{1}{2}$	-52610°
2306.540	A	60r	0.00	5.35	$2\frac{1}{2}-1\frac{1}{2}$	-43341°							
*2302.992	A	150R	0.00	5.36	$2\frac{1}{2}-1\frac{1}{2}?$	-43409°							
2281.620	A	200R	0.00	5.41	$2\frac{1}{2}-3\frac{1}{2}$	-43815°	Air						
*2302.992	A	150R	0.00	5.36	$2\frac{1}{2}-3\frac{1}{2}$	$a^6S - z^4D^\circ$	2962.266	A	30r	1.43	5.60	$2\frac{1}{2}-2\frac{1}{2}$	$a^4P - 45332^\circ$
2322.490	A	50R	0.00	5.31	$2\frac{1}{2}-2\frac{1}{2}$	(9)	2850.975	A	60r	1.43	5.76	$2\frac{1}{2}-2\frac{1}{2}$	(15) -46649°
							2814.676	A	40R	1.43	5.81	$2\frac{1}{2}-2\frac{1}{2}$	-47101°
2274.618	A	300R	0.00	5.43	$2\frac{1}{2}-2\frac{1}{2}$	$a^6S - 43949^\circ$	2770.417	A	70R	1.43	5.88	$2\frac{1}{2}-3\frac{1}{2}$	-47669°
2264.393	A	200R	0.00	5.45	$2\frac{1}{2}-1\frac{1}{2}$	(10) -44148°	2747.438	A	20r	1.43	5.92	$2\frac{1}{2}-2\frac{1}{2}$	-47970°
2256.193	A	150R	0.00	5.47	$2\frac{1}{2}-2\frac{1}{2}$	-44308°	2654.120	A	40R	1.43	6.08	$2\frac{1}{2}-1\frac{1}{2}$	-49250°
2235.440	A	50r	0.00	5.52	$2\frac{1}{2}-1\frac{1}{2}$	-44720°	2611.603	A	40R	1.43	6.16	$2\frac{1}{2}-3\frac{1}{2}$	-49863°
2226.418	A	300R	0.00	5.54	$2\frac{1}{2}-3\frac{1}{2}$	-44901°	2594.854	A	30R	1.43	6.19	$2\frac{1}{2}-2\frac{1}{2}$	-50110°
							2591.582	A	30r	1.43	6.19	$2\frac{1}{2}-2\frac{1}{2}$	-50158°
							2564.186	A	50R	1.43	6.24	$2\frac{1}{2}-1\frac{1}{2}$	-50571°
							2544.739	A	100r	1.43	6.28	$2\frac{1}{2}-3\frac{1}{2}$	-50869°

Re I—Continued

Re I—Continued

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Air							Air						
2540.513	A	40r	1.43	6.29	$2\frac{1}{2}-2\frac{1}{2}$	$a^4P -50934^\circ$	2843.000	A	60r	1.95	6.29	$2\frac{1}{2}-2\frac{1}{2}$	$a^4D -50934^\circ$
2444.943	A	70r	1.43	6.48	$2\frac{1}{2}-2\frac{1}{2}$	(16) -52472°	2688.528	A	100	1.95	6.54	$2\frac{1}{2}-1\frac{1}{2}$	(24) -52954°
2410.37	A	30r	1.43	6.55	$2\frac{1}{2}-2\frac{1}{2}$	-53058°	*2442.510	A	40r	1.95	7.00	$2\frac{1}{2}-3\frac{1}{2}$	-56699°
2396.791	A	40r	1.43	6.58	$2\frac{1}{2}-1\frac{1}{2}$	-53293°	2419.404	A	60r	1.95	7.05	$2\frac{1}{2}-3\frac{1}{2}$	-57090°
2394.37	A	30r	1.43	6.58	$2\frac{1}{2}-3\frac{1}{2}$	-53335°	2414.587	A	30r	1.95	7.06	$2\frac{1}{2}-3\frac{1}{2}$	-57172°
2391.278	A	30r	1.43	6.59	$2\frac{1}{2}-2\frac{1}{2}$	-53389°	2296.926	A	40r	1.95	7.32	$2\frac{1}{2}-1\frac{1}{2}$	-59293°
2371.500	A	30r	1.43	6.63	$2\frac{1}{2}-3\frac{1}{2}$	-53738°	2271.300	A	40r	1.95	7.38	$2\frac{1}{2}-3\frac{1}{2}$	-59784°
2365.666	A	20r	1.43	6.65	$2\frac{1}{2}-1\frac{1}{2}$	-53842°							
2352.069	A	100R	1.43	6.68	$2\frac{1}{2}-3\frac{1}{2}$	-54086°							
2334.33	A	20r	1.43	6.72	$2\frac{1}{2}-2\frac{1}{2}$	-54409°							
2328.664	A	30r	1.43	6.73	$2\frac{1}{2}-3\frac{1}{2}$	-54513°	3001.137	A	20r	1.81	5.92	$2\frac{1}{2}-3\frac{1}{2}$	$a^4G - y^6F^\circ$ (25)
*2255.729	A	100r	1.43	6.90	$2\frac{1}{2}-3\frac{1}{2}$	$a^4P -55901^\circ$							
*2255.729	A	100r	1.43	6.90	$2\frac{1}{2}-1\frac{1}{2}$	(17) -55902°	2834.077	A	40	1.81	6.16	$2\frac{1}{2}-1\frac{1}{2}$	$a^4G -49895^\circ$
2067.89	A	20r	1.43	7.40	$2\frac{1}{2}-3\frac{1}{2}$	-59926°	2757.996	A	40r	1.81	6.28	$2\frac{1}{2}-3\frac{1}{2}$	(26) -50869°
2033.78	A	20r	1.43	7.50	$2\frac{1}{2}-2\frac{1}{2}$	-60737°	2683.558	A	40	1.81	6.40	$2\frac{1}{2}-1\frac{1}{2}$	-51874°
							2614.558	A	50R	1.81	6.53	$2\frac{1}{2}-3\frac{1}{2}$	-52857°
2840.348	A	50r	1.71	6.05	$1\frac{1}{2}-2\frac{1}{2}$	$a^4P -49023^\circ$	*2421.730	A	40r	1.81	6.90	$2\frac{1}{2}-3\frac{1}{2}$	-55901°
2599.856	A	50R	1.71	6.45	$1\frac{1}{2}-1\frac{1}{2}$	(18) -52278°	*2421.730	A	40r	1.81	6.90	$2\frac{1}{2}-1\frac{1}{2}$	-55902°
2533.310	A	15r	1.71	6.58	$1\frac{1}{2}-0\frac{1}{2}$	-53288°	2375.815	A	15r	1.81	7.00	$2\frac{1}{2}-3\frac{1}{2}$	-56699°
2345.282	A	20r	1.71	6.97	$1\frac{1}{2}-0\frac{1}{2}$	-56451°	2353.95	A	30r	1.81	7.05	$2\frac{1}{2}-3\frac{1}{2}$	-57090°
2397.31	A	50	1.87	7.02	$0\frac{1}{2}-1\frac{1}{2}$	-56866°	2349.391	A	30r	1.81	7.06	$2\frac{1}{2}-3\frac{1}{2}$	-57172°
2999.599	A	200R	1.45	5.57	$4\frac{1}{2}-5\frac{1}{2}$	$a^6D - y^6F^\circ$	2786.558	A	20r	1.86	6.29	$3\frac{1}{2}-2\frac{1}{2}$	$a^4G -50934^\circ$
2887.676	A	300R	1.45	5.72	$4\frac{1}{2}-4\frac{1}{2}$	(19)	2763.792	A	40	1.86	6.32	$3\frac{1}{2}-3\frac{1}{2}$	(27) -51229°
2763.295	A	40	1.45	5.92	$4\frac{1}{2}-3\frac{1}{2}$		2732.206	A	50R	1.86	6.38	$3\frac{1}{2}-3\frac{1}{2}$	-51647°
							2393.645	A	50r	1.86	7.01	$3\frac{1}{2}-2\frac{1}{2}$	-56822°
*2976.294	A	40	1.45	5.60	$4\frac{1}{2}-4\frac{1}{2}$	$a^6D -45343^\circ$	2367.683	A	50r	1.86	7.07	$3\frac{1}{2}-4\frac{1}{2}$	-57280°
2965.756	A	150R	1.45	5.61	$4\frac{1}{2}-3\frac{1}{2}$	(20) -45462°	2354.08	A	30r	1.86	7.10	$3\frac{1}{2}-2\frac{1}{2}$	-57524°
2927.42	A	40	1.45	5.67	$4\frac{1}{2}-5\frac{1}{2}$	-45904°	2183.72	A	100R	1.86	7.51	$3\frac{1}{2}-2\frac{1}{2}$	-60837°
2819.951	A	50	1.45	5.83	$4\frac{1}{2}-4\frac{1}{2}$	-47205°	2113.87	A	30r	1.86	7.70	$3\frac{1}{2}-3\frac{1}{2}$	-62350°
2783.570	A	60	1.45	5.88	$4\frac{1}{2}-3\frac{1}{2}$	-47669°	2107.452	A	60r	1.86	7.71	$3\frac{1}{2}-3\frac{1}{2}$	-62493°
2715.474	A	300R	1.45	6.00	$4\frac{1}{2}-5\frac{1}{2}$	-48569°	2315.956	A	30r	2.05	7.38	$4\frac{1}{2}-3\frac{1}{2}$	$a^4G -59784^\circ$ (28)
2671.842	A	40	1.45	6.07	$4\frac{1}{2}-4\frac{1}{2}$	-49170°							
2663.633	A	50	1.45	6.08	$4\frac{1}{2}-5\frac{1}{2}$	-49286°	2909.820	A	60r	2.01	6.25	$5\frac{1}{2}-5\frac{1}{2}$	$a^4G -50663^\circ$
2642.752	A	60R	1.45	6.12	$4\frac{1}{2}-4\frac{1}{2}$	-49582°	2791.290	A	50r	2.01	6.43	$5\frac{1}{2}-6\frac{1}{2}$	(29) -52122°
2586.788	A	50R	1.45	6.22	$4\frac{1}{2}-4\frac{1}{2}$	-50401°	2320.162	A	50r	2.01	7.33	$5\frac{1}{2}-4\frac{1}{2}$	-59394°
2545.485	A	30r	1.45	6.30	$4\frac{1}{2}-4\frac{1}{2}$	-51027°	2319.19	A	30r	2.01	7.33	$5\frac{1}{2}-5\frac{1}{2}$	-59412°
2516.120	A	150r	1.45	6.36	$4\frac{1}{2}-4\frac{1}{2}$	$a^6D -51486^\circ$							
2487.331	A	200R	1.45	6.41	$4\frac{1}{2}-5\frac{1}{2}$	(21) -51945°							
2483.920	A	200R	1.45	6.42	$4\frac{1}{2}-4\frac{1}{2}$	-52001°	*2442.510	A	40r	2.14	7.19	$3\frac{1}{2}-3\frac{1}{2}$	$a^4D -58260^\circ$ (30)
2461.196	A	200R	1.45	6.47	$4\frac{1}{2}-3\frac{1}{2}$	-52373°							
2432.18	A	80	1.45	6.53	$4\frac{1}{2}-3\frac{1}{2}$	-52857°							
2405.056	A	300R	1.45	6.58	$4\frac{1}{2}-4\frac{1}{2}$	-53320°							
2381.136	A	40	1.45	6.63	$4\frac{1}{2}-3\frac{1}{2}$	-53738°							
*2369.27	A	50r	1.45	6.66	$4\frac{1}{2}-5\frac{1}{2}$	-53948°	2620.344	A	30R	2.69	7.40	$3\frac{1}{2}-3\frac{1}{2}$	$a^2F -59926^\circ$ (31)
2356.496	A	30r	1.45	6.69	$4\frac{1}{2}-3\frac{1}{2}$	-54177°							
2337.953	A	40R	1.45	6.73	$4\frac{1}{2}-3\frac{1}{2}$	-54513°							
2335.730	A	20r	1.45	6.73	$4\frac{1}{2}-5\frac{1}{2}$	-54554°							
2238.603	A	40r	1.45	6.96	$4\frac{1}{2}-4\frac{1}{2}$	-56411°							
3108.808	A	100R	1.76	5.72	$3\frac{1}{2}-4\frac{1}{2}$	$a^6D - y^6F^\circ$	2902.48	A	100	2.77	7.02	$1\frac{1}{2}-1\frac{1}{2}$	$a^2D -56866^\circ$ (32)
2965.112	A	80R	1.76	5.92	$3\frac{1}{2}-3\frac{1}{2}$	(22)							
2943.145	A	50r	1.76	5.95	$3\frac{1}{2}-3\frac{1}{2}$	$a^6D -48184^\circ$							
2785.206	A	50r	1.76	6.19	$3\frac{1}{2}-2\frac{1}{2}$	(23) -50110°							
2781.434	A	30r	1.76	6.19	$3\frac{1}{2}-2\frac{1}{2}$	-50158°							
2722.702	A	80	1.76	6.29	$3\frac{1}{2}-2\frac{1}{2}$	-50934°							
2715.770	A	30r	1.76	6.30	$3\frac{1}{2}-4\frac{1}{2}$	-51027°							
2649.050	A	50R	1.76	6.41	$3\frac{1}{2}-3\frac{1}{2}$	-51955°							
2620.026	A	40R	1.76	6.47	$3\frac{1}{2}-3\frac{1}{2}$	-52373°							
2556.512	A	80R	1.76	6.58	$3\frac{1}{2}-4\frac{1}{2}$	-53320°							
2552.021	A	40r	1.76	6.59	$3\frac{1}{2}-2\frac{1}{2}$	-53389°							
2501.721	A	50r	1.76	6.69	$3\frac{1}{2}-3\frac{1}{2}$	-54177°							
2375.073	A	100r	1.76	6.95	$3\frac{1}{2}-4\frac{1}{2}$	-56307°							
*2369.27	A	50r	1.76	6.96	$3\frac{1}{2}-4\frac{1}{2}$	-56411°							

Re II

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Re II

Re II

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Vac 1973.13†	A	150	0.00	6.26	3-4	$a^7S - z^7P^\circ$ (1)	Air 2635.83	A	200cwl	2.13	6.81	2-1	$a^5S - y^5P^\circ \dagger$ (10)
Air 2214.26	A	1000cw	0.00	5.57	3-3								
2275.25	A	500c	0.00	5.42	3-2		2181.77	A	100cw	2.13	7.78	2-3	$a^5S - 63043^\circ$ (11)
Vac 1858.65	A	200	0.00	6.64	3-3	$a^7S - z^5P^\circ$							
1898.36	A	100	0.00	6.50	3-2	(2)							
1750.14	A	200d?	0.00	6.50	3-2	$a^7S - z^5D^\circ \dagger$ (3)	2386.90	A	100cw	2.59	7.76	5-4	$a^5G - z^5D^\circ \dagger$ (12)
							2469.36	A	100cwl	2.33	7.32	2-3	
							2588.58	A	60cd	2.59	7.36	5-4	$a^5G - z^5F^\circ \dagger$ (13)
							2753.64	A	100cws	2.36	6.84	3-2	
							2554.63	A	200	2.53	7.36	4-4	
							2637.01	A	150c	2.36	7.04	3-3	
Air 2568.64	A	300	1.84	6.64	4-3	$a^5D - z^5P^\circ \dagger$	2731.56	A	150cwl	2.33	6.84	2-2	
2571.81	A	300cw	1.84	6.64	3-3	(4)	2616.72	A	150cwl	2.33	7.04	2-3	
2608.50	A	400	1.77	6.50	2-2								
2455.83	A	100c	1.77	6.80	2-2	$a^5D - y^5P^\circ \dagger$ (5)	2502.35	A	200cw	2.59	7.52	5-5	$a^5G - z^5G^\circ ? \dagger$ (14)
							2550.09	A	100cw	2.53	7.37	4-3	$a^5G - 59665^\circ$ (15)
2023.64	A	200	1.84	7.94	4-5	$a^5D - z^5F^\circ \dagger$	2449.03	A	100c	2.33	7.37	2-3	
2235.80	A	100c	1.84	7.36	4-4	(6)							
2370.76	A	100	1.84	7.04	4-3		2114.25	A	100	2.59	8.43	5-5	$a^5G - 68259^\circ \dagger$ (16)
2467.57	A	100c	1.83	6.84	3-2								
Vac 1725.20	A	100	1.84	7.04	4-3	$a^5D - 72846^\circ$ (7)	2009.92	A	100	2.36	8.50	3-	$a^5G - 68876^\circ \dagger$ (17)
Air 2733.04	A	300cl	2.13	6.64	2-3	$a^5S - z^5P^\circ \dagger$	2628.26	A	100h	2.67	7.37	3-3	$a^5P - 59665^\circ$ (18)
2819.78	A	60cwl	2.13	6.50	2-2	(8)							
2553.59	A	100cw	2.13	6.96	2-1	$a^5S - z^5D^\circ \dagger$ (9)	2177.85	A	100	2.89	8.55	5-4	23381-69283° (19)

OSMIUM, $Z = 76$

Os I

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T, C L, W L, I
Th. A. M. van Kleef and P. F. A. Klinkenberg, Physica 27, 83 (1961). I P, T
* and §=Blend of Os I and Os II

Os I

Os I

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Air							Air						
*2929.507	A	30	0.00	4.21	4-3	a^5D -34125°	2829.269	A	40	0.51	4.88	3-2	a^5D -39493°
2909.061 ‡	A	500R	0.00	4.24	4-5	(1) -34365°	2782.552	A	40	0.51	4.95	3-4	(5) -40087°
2872.405	A	50	0.00	4.30	4-4	-34803°	*2761.418	A	50	0.51	4.98	3-4	-40361°
2806.906	A	100w	0.00	4.40	4-3	-35615°	2721.862	A	75	0.51	5.05	3-2	-40888°
2714.642	A	50r	0.00	4.55	4-4	-36826°	2619.944	A	30	0.51	5.22	3-3	-42316°
2644.114	A	75	0.00	4.67	4-3	-37808°	2590.755	A	75	0.51	5.28	3-4	-42746°
2637.133	A	150	0.00	4.68	4-4	-37908°	2374.337	A	25	0.51	5.71	3-4	-46263°
2621.818	A	25	0.00	4.71	4-4	-38130°	*2370.699	A	25	0.51	5.72	3-3	-46327°
2476.836	A	25	0.00	4.98	4-4	-40361°							
2424.970	A	50	0.00	5.09	4-5	-41225°	2345.770	A	25	0.51	5.77	3-3	a^5D -46776°
							2283.67	A	50	0.51	5.92	3-2	(6) -47934°
2387.292	A	40	0.00	5.17	4-3	a^5D -41875°	2241.62	A	25	0.51	6.02	3-4	-48756°
2362.771	A	50	0.00	5.22	4-4	(2) -42310°	2223.85	A	30	0.51	6.06	3-2	-49112°
*2362.411	A	25	0.00	5.22	4-3	-42316°	2165.19	A	40	0.51	6.21	3-3	-50329°
2338.650	A	30l	0.00	5.28	4-4	-42746°	2157.08	A	25	0.51	6.23	3-4	-50503°
2324.24	A	30	0.00	5.31	4-3	-43011°	2123.84	A	40	0.51	6.32	3-3	-51228°
2278.44	A	25	0.00	5.42	4-5	-43876°	2063.55	A	25	0.51	6.49	3-3	-52604°
*2227.98 §	A	30	0.00	5.54	4-3	-44869°							
2226.83	A	25	0.00	5.54	4-4	-44892°	2949.532	A	30	0.34	4.52	2-2	a^5D -36634°
2225.44	A	25	0.00	5.55	4-5	-44921°	2934.642	A	30	0.34	4.54	2-3	(7) -36806°
2202.49	A	25	0.00	5.60	4-4	-45388°	2919.794	A	100	0.34	4.57	2-1	-36979°
							2850.762	A	75	0.34	4.67	2-3	-37808°
*2184.68	A	25	0.00	5.65	4-5	a^5D -45758°	2815.780	A	40	0.34	4.72	2-1	-38244°
2157.84	A	30	0.00	5.72	4-3	(3) -46327°	*2814.200	A	50	0.34	4.72	2-3	-38264°
2124.39	A	25	0.00	5.81	4-3	-47057°	2808.935	A	40	0.34	4.73	2-2	-38330°
2117.96	A	80	0.00	5.83	4-5	-47200°	*2796.727	A	100	0.34	4.75	2-3	-38486°
2079.97	A	40	0.00	5.93	4-5	-48062°	2786.798	A	40	0.34	4.77	2-1	-38613°
2076.95	A	25	0.00	5.94	4-4	-48131°	*2776.910	A	25	0.34	4.78	2-2	-38741°
2069.61	A	25	0.00	5.96	4-3	-48302°							
2034.44	A	30	0.00	6.07	4-3	-49138°	2720.044	A	75	0.34	4.88	2-2	a^5D -39493°
							2706.702	A	50	0.34	4.90	2-2	(8) -39674°
2970.972	A	40	0.51	4.67	3-3	a^5D -37808°	2647.730	A	25	0.34	5.00	2-1	-40497°
2962.148	A	30	0.51	4.68	3-4	(4) -37908°	*2527.075	A	30r	0.34	5.22	2-1	-42299°
*2961.012	A	40	0.51	4.68	3-2	-37921°	2456.462	A	125	0.34	5.36	2-2	-43437°
2942.848	A	30	0.51	4.71	3-4	-38130°	2451.726	A	125	0.34	5.37	2-3	-43515°
2931.280	A	40	0.51	4.72	3-3	-38264°	2414.517	A	25	0.34	5.45	2-3	-44144°
*2925.568	A	40	0.51	4.73	3-2	-38330°	2384.632	A	30	0.34	5.51	2-2	-44662°
*2912.334	A	50	0.51	4.75	3-3	-38486°	2380.823	A	30	0.34	5.52	2-1	-44729°
2838.173	A	30	0.51	4.86	3-3	-39382°	2372.921	A	25	0.34	5.54	2-3	-44869°

Os I—Continued

Os I—Continued

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Air							Air						
2301.88	A	25	0.34	5.70	2-2	$a^5D -46169^\circ$	*2982.902	A	40	1.40	5.54	3-4	$a^5F -44892^\circ$
2270.17	A	60	0.34	5.77	2-3	(9) -46776°	*2929.507	A	30	1.40	5.62	3-2	(17) -45503°
2268.28	A	40	0.34	5.78	2-2	-46812°	2649.335	A	25	1.40	6.06	3-2	-49112°
2234.61	A	35	0.34	5.86	2-1	-47477°	*2527.075	A	30r	1.40	6.29	3-4	-50937°
2211.96	A	40	0.34	5.92	2-2	-47934°	*2431.607	A	40	1.40	6.48	3-4	-52490°
2188.97	A	50	0.34	5.98	2-1	-48409°	2394.292	A	45	1.40	6.56	3-4	-53131°
2158.53	A	50	0.34	6.06	2-1	-49053°	2382.479	A	30	1.40	6.58	3-3	-53338°
2154.59	A	25	0.34	6.07	2-3	-49138°	2377.618	A	50	1.40	6.60	3-2	-53424°
2117.66	A	40	0.34	6.17	2-3	-49947°	2351.732	A	25	1.40	6.65	3-3	-53887°
2048.28	A	25	0.34	6.36	2-2	-51545°	2341.949	A	30l	1.40	6.67	3-2	-54064°
2964.062	A	25	0.71	4.88	1-2	$a^5D -39493^\circ$	2509.936	A	25	1.58	6.49	2-3	$a^5F -52604^\circ$
2878.400	A	40	0.71	5.00	1-1	(10) -40497°	*2431.607	A	40	1.58	6.65	2-3	(18) -53887°
2846.391	A	40	0.71	5.05	1-2	-40888°	2396.784	A	100	1.58	6.73	2-1	-54484°
*2540.741	A	40	0.71	5.57	1-0	-45113°	2378.746	A	25	1.58	6.77	2-1	-54800°
2378.151	A	30	0.71	5.90	1-0	-47802°							
*2370.699	A	25	0.71	5.92	1-2	-47934°	2896.063	A	40	1.61	5.87	1-2	$a^5F -47539^\circ$
2201.93	A	25	0.71	6.32	1-0	-51166°							
*2097.60	A	25	0.71	6.60	1-2	-53424°							
2905.730	A	40	0.75	5.00	0-1	$a^5D -40497^\circ$	2997.647	A	40	1.25	5.37	2-3	$a^3P -43515^\circ$
*2362.411	A	25	0.75	5.98	0-1	(11) -48409°	2913.844	A	30	1.25	5.49	2-1	(20) -44474°
2276.43	A	30	0.75	6.17	0-1	-50007°	2674.885	A	25	1.25	5.87	2-2	-47539°
2159.98	A	60	0.75	6.47	0-1	-52374°	2351.579	A	25	1.25	6.50	2-3	-52677°
							2309.40	A	40	1.25	6.60	2-1	-53454°
							2286.517	A	30	1.25	6.65	2-3	-53887°
							2242.10	A	30	1.25	6.76	2-2	-54753°
2860.956	A	100	0.64	4.95	5-4	$a^5F -40087^\circ$	*2776.910	A	25	2.26	6.70	0-1	$a^3P -54302^\circ$
2844.396	A	50	0.64	4.97	5-6	(12) -40290°							
2838.626	A	100R	0.64	4.98	5-4	-40361°							
2786.306	A	25	0.64	5.06	5-6	-41023°							
2732.805	A	75	0.64	5.15	5-4	-41725°							
2689.816	A	50	0.64	5.22	5-4	-42310°	2895.064	A	25	1.36	5.62	4-3	$a^3F -45561^\circ$
2658.600	A	50	0.64	5.28	5-4	-42746°	2877.351	A	30	1.36	5.65	4-3	(22) -45774°
2613.058	A	50	0.64	5.36	5-5	-43401°	2837.422	A	25	1.36	5.71	4-4	-46263°
							*2796.727	A	100	1.36	5.77	4-3	-46776°
2581.958	A	80s	0.64	5.41	5-4	$a^5F -43862^\circ$	*2699.589	A	50	1.36	5.93	4-5	-48062°
2581.052	A	25	0.64	5.42	5-5	(13) -43876°	2568.834	A	25l	1.36	6.17	4-3	-49947°
2515.044	A	40s	0.64	5.54	5-4	-44892°	*2540.741	A	40	1.36	6.22	4-5	-50377°
2513.246	A	50	0.64	5.55	5-5	-44921°	2398.200	A	25	1.36	6.51	4-4	-52715°
2488.548	A	50w	0.64	5.59	5-6	-45315°	2374.527	A	25	1.36	6.56	4-4	-53131°
2461.417	A	50	0.64	5.65	5-5	-45758°							
*2431.193	A	40	0.64	5.71	5-4	-46263°	*2961.012	A	40	1.74	5.91	3-4	$a^3F -47853^\circ$
2379.393	A	40	0.64	5.82	5-4	-47158°	*2814.200	A	50	1.74	6.12	3-2	(23) -49614°
							*2761.418	A	50	1.74	6.21	3-4	-50293°
2377.03	A	50	0.64	5.83	5-5	$a^5F -47200^\circ$							
2304.38	A	40	0.64	5.99	5-4	(14) -48525°	2757.808	A	25	1.65	6.12	2-2	$a^3F -49614^\circ$
2214.16	A	25	0.64	6.21	5-4	-50293°	*2431.193	A	40	1.65	6.73	2-1	(24) -54484°
2203.91	A	25	0.64	6.23	5-4	-50503°							
*2184.68	A	25	0.64	6.28	5-5	-50902°							
2164.49	A	25	0.64	6.34	5-4	-51329°							
*2097.60	A	25	0.64	6.52	5-6	-52801°							
2977.637	A	30	1.08	5.22	4-3	$a^5F -42316^\circ$	*2982.902	A	40	1.77	5.91	5-4	$a^3G -47853^\circ$
2917.258	A	40	1.08	5.31	4-3	(15) -43011°							
2874.955	A	50	1.08	5.37	4-3	-43515°	*2848.247	A	30	1.83	6.17	4-3	$a^3G -49947^\circ$
2855.337	A	25	1.08	5.40	4-4	-43754°							
2763.273	A	25	1.08	5.55	4-5	-44921°							
*2699.589	A	50	1.08	5.65	4-3	-45774°	2804.067	A	80	1.90	6.30	3-3	$a^5P -51042^\circ$
2659.833	A	30	1.08	5.72	4-3	-46327°							
2571.782	A	25	1.08	5.88	4-3	-47614°							
2542.512	A	50	1.08	5.93	4-5	-48062°	2860.063	A	25	2.00	6.32	1-0	$a^5P -51166^\circ$
*2527.075	A	30r	1.08	5.96	4-3	-48302°	*2848.247	A	30	2.00	6.33	1-2	(28) -51311°
2512.873	A	40	1.08	5.99	4-4	$a^5F -48525^\circ$							
2450.738	A	25	1.08	6.12	4-5	(16) -49534°							
2403.853	A	25	1.08	6.21	4-3	-50329°	*2925.568	A	40	2.33	6.55	3-2	$a^3D -53073^\circ$
2401.127	A	25	1.08	6.22	4-5	-50377°							
2393.866	A	30	1.08	6.23	4-4	-50503°							
2371.188	A	50	1.08	6.28	4-5	-50902°							
2369.255	A	50	1.08	6.29	4-4	-50937°	*2912.334	A	50	3.12	7.36	2-2	$z^7D^\circ -59602$
2357.267	A	25	1.08	6.31	4-5	-51151°							(30)
2353.006	A	30l	1.08	6.32	4-3	-51228°							

Os II

I P Anal C List C April 1961

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 Th. A. M. van Kleef and P. F. A. Klinkenberg, Physica 27, 83 (1961). T
 * and §=Blend of Os II and Os I

Os II

Os II

I A	Ref	Int	E P		J	Multiplet No.		I A	Ref	Int	E P		J	Multiplet No.
			Low	High							Low	High		
Air								Air						
2537.997	A	15	0.00	4.86	4½-3½	a 6D	-39389°	2468.898	A	30	1.41	6.41	3½-4½	a 4D -51951°
2282.26	A	125	0.00	5.41	4½-3½	(1)	-43802°	2325.65	A	15	1.41	6.72	3½-2½	(6) -54445°
2255.847	A	125	0.00	5.47	4½-4½		-44315°	2225.27	A	20	1.41	6.96	3½-4½	-56384°
2486.244	A	15h	0.44	5.41	3½-3½	a 6D	-43802°	2214.76	A	30	1.44	7.01	2½-3½	a 4D -56791°
2336.803	A	80	0.44	5.72	3½-2½	(2)	-46373°						(7)	
2194.39	A	100	0.44	6.07	3½-3½		-49149°							
2067.21	A	40	0.44	6.41	3½-4½		-51951°							
2367.354	A	80	0.49	5.70	2½-1½	a 6D	-46157°	2580.026	A	100w	1.63	6.41	3½-4½	a 4F -51951°
2355.284	A	25	0.49	5.72	2½-2½	(3)	-46373°	2563.164	A	25	1.63	6.44	3½-3½	(8) -52206°
*2227.98§	A	30	0.49	6.02	2½-2½		-48798°	2427.900	A	40	1.63	6.71	3½-3½	-54379°
							-48798°	2424.024	A	10	1.63	6.72	3½-2½	-54445°
2350.242	A	50	0.69	5.94	1½-0½	a 6D	-48128°	2315.16	A	25	1.63	6.96	3½-4½	-56384°
2313.75	A	30	0.69	6.02	1½-2½	(4)	-48798°	2293.54	A	25	1.63	7.01	3½-3½	-56791°
2164.85	A	50	0.69	6.39	1½-2½		-51770°							
2046.28	A	10	0.69	6.72	1½-2½		-54445°							
								2578.321	A	10	1.93	6.71	4½-3½	a 2G -54379°
								2391.770	A	20	1.93	7.09	4½-3½	(9) -57402°
2423.071	A	80	0.97	6.07	2½-3½	a 6S	-49149°	2527.756	A	10h	2.13	7.01	3½-3½	a 2G -56791°
						(5)		2489.280	A	10h	2.13	7.09	3½-3½	(10) -57402°
								2548.832	A	15	2.17	7.01	2½-3½	a 4P -56791°
								2509.708	A	20	2.17	7.09	2½-3½	(11) -57402°

IRIDIUM, $Z = 77$

Ir I

I P 9 Anal C List C July 1961

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Ir I

Ir I

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Air							Air						
2924.792	A	(100r)	0.00	4.22	$4\frac{1}{2}-5\frac{1}{2}$	a^4F —34180°	2379.379	A	25	0.50	5.69	$1\frac{1}{2}-2\frac{1}{2}$	a^4F —46093°
2849.725	A	(80r)	0.00	4.33	$4\frac{1}{2}-4\frac{1}{2}$	(1) —35080°	2358.165	A	25	0.50	5.74	$1\frac{1}{2}-1\frac{1}{2}$	(4) —46471°
2664.786	A	(50r)	0.00	4.63	$4\frac{1}{2}-3\frac{1}{2}$	—37515°	2235.289	A	25	0.50	6.02	$1\frac{1}{2}-1\frac{1}{2}$	cont. —48801°
2639.712	A	(60r)	0.00	4.68	$4\frac{1}{2}-4\frac{1}{2}$	—37871°	2172.21	A	30	0.50	6.18	$1\frac{1}{2}-1\frac{1}{2}$	—50100°
2619.883	A	35	0.00	4.71	$4\frac{1}{2}-3\frac{1}{2}$	—38158°							
2614.984	A	25	0.00	4.72	$4\frac{1}{2}-4\frac{1}{2}$	—38229°							
*2592.056	A	100	0.00	4.76	$4\frac{1}{2}-3\frac{1}{2}$	—38568°	*2882.635	A	(60)	0.35	4.63	$4\frac{1}{2}-3\frac{1}{2}$	b^4F —37515°
2502.983	A	100w	0.00	4.93	$4\frac{1}{2}-5\frac{1}{2}$	—39940°	2824.448	A	(60r)	0.35	4.72	$4\frac{1}{2}-4\frac{1}{2}$	(5) —38229°
2481.183	A	50	0.00	4.97	$4\frac{1}{2}-3\frac{1}{2}$	—40291°	2694.233	A	150h	0.35	4.93	$4\frac{1}{2}-5\frac{1}{2}$	—39940°
2475.122	A	100	0.00	4.99	$4\frac{1}{2}-4\frac{1}{2}$	—40389°	2668.993	A	50	0.35	4.97	$4\frac{1}{2}-3\frac{1}{2}$	—40291°
2455.609	A	35	0.00	5.03	$4\frac{1}{2}-3\frac{1}{2}$	—40710°	2661.983	A	150h	0.35	4.99	$4\frac{1}{2}-4\frac{1}{2}$	—40389°
2431.241	A	25	0.00	5.08	$4\frac{1}{2}-4\frac{1}{2}$	—41118°	2611.295	A	80	0.35	5.08	$4\frac{1}{2}-4\frac{1}{2}$	—41118°
2372.774	A	100	0.00	5.20	$4\frac{1}{2}-5\frac{1}{2}$	—42131°	2543.971†	A	200h	0.35	5.20	$4\frac{1}{2}-5\frac{1}{2}$	—42131°
2315.378	A	30	0.00	5.33	$4\frac{1}{2}-3\frac{1}{2}$	—43176°	2534.457	A	100	0.35	5.22	$4\frac{1}{2}-4\frac{1}{2}$	—42279°
2238.818	A	30	0.00	5.51	$4\frac{1}{2}-4\frac{1}{2}$	—44652°	2452.807	A	35	0.35	5.38	$4\frac{1}{2}-3\frac{1}{2}$	—43592°
2216.031	A	25	0.00	5.57	$4\frac{1}{2}-3\frac{1}{2}$	—45111°	2391.178	A	50	0.35	5.51	$4\frac{1}{2}-3\frac{1}{2}$	—44642°
2178.171	A	25	0.00	5.67	$4\frac{1}{2}-3\frac{1}{2}$	—45895°	2390.617	A	40	0.35	5.51	$4\frac{1}{2}-4\frac{1}{2}$	—44652°
2175.245	A	30	0.00	5.67	$4\frac{1}{2}-5\frac{1}{2}$	—45957°	2304.215	A	100	0.35	5.71	$4\frac{1}{2}-4\frac{1}{2}$	—46220°
2162.88	A	25	0.00	5.71	$4\frac{1}{2}-4\frac{1}{2}$	—46230°	2296.209	A	25	0.35	5.72	$4\frac{1}{2}-4\frac{1}{2}$	—46371°
2155.81	A	25	0.00	5.72	$4\frac{1}{2}-4\frac{1}{2}$	—46371°	2264.607	A	30	0.35	5.80	$4\frac{1}{2}-3\frac{1}{2}$	—46979°
2088.82	A	50	0.00	5.91	$4\frac{1}{2}-5\frac{1}{2}$	—47858°	2255.101	A	25	0.35	5.82	$4\frac{1}{2}-3\frac{1}{2}$	—47165°
							2235.750	A	25	0.35	5.87	$4\frac{1}{2}-3\frac{1}{2}$	—47548°
2985.800	A	25	0.78	4.91	$3\frac{1}{2}-2\frac{1}{2}$	a^4F —39805°	2220.373	A	50	0.35	5.91	$4\frac{1}{2}-5\frac{1}{2}$	—47858°
2943.151	A	30	0.78	4.97	$3\frac{1}{2}-3\frac{1}{2}$	(2) —40291°	2198.854	A	50	0.35	5.96	$4\frac{1}{2}-4\frac{1}{2}$	—48299°
*2907.235	A	25	0.78	5.03	$3\frac{1}{2}-3\frac{1}{2}$	—40710°	2191.64	A	30	0.35	5.98	$4\frac{1}{2}-3\frac{1}{2}$	—48448°
2712.740	A	40	0.78	5.33	$3\frac{1}{2}-3\frac{1}{2}$	—43176°	2158.05	A	50	0.35	6.07	$4\frac{1}{2}-4\frac{1}{2}$	—49158°
2608.246	A	50	0.78	5.51	$3\frac{1}{2}-4\frac{1}{2}$	—44652°	2039.43	A	25	0.35	6.40	$4\frac{1}{2}-3\frac{1}{2}$	—51852°
2547.205	A	25	0.78	5.63	$3\frac{1}{2}-2\frac{1}{2}$	—45570°							
2386.892	A	50	0.78	5.95	$3\frac{1}{2}-2\frac{1}{2}$	—48206°	2939.265	A	(30)	0.88	5.08	$3\frac{1}{2}-4\frac{1}{2}$	b^4F —41118°
2381.622	A	30	0.78	5.96	$3\frac{1}{2}-4\frac{1}{2}$	—48299°	2904.799	A	25	0.88	5.13	$3\frac{1}{2}-2\frac{1}{2}$	(6) —41522°
2363.042	A	50	0.78	6.00	$3\frac{1}{2}-3\frac{1}{2}$	—48629°	2662.626	A	40	0.88	5.51	$3\frac{1}{2}-4\frac{1}{2}$	—44652°
2334.505	A	25	0.78	6.07	$3\frac{1}{2}-2\frac{1}{2}$	—49146°	2599.040	A	25	0.88	5.63	$3\frac{1}{2}-2\frac{1}{2}$	—45570°
2333.839	A	40	0.78	6.07	$3\frac{1}{2}-4\frac{1}{2}$	—49158°	2577.265	A	60	0.88	5.67	$3\frac{1}{2}-3\frac{1}{2}$	—45895°
2300.499	A	30	0.78	6.15	$3\frac{1}{2}-2\frac{1}{2}$	—49779°	2564.177	A	40	0.88	5.69	$3\frac{1}{2}-2\frac{1}{2}$	—46093°
2266.331	A	25	0.78	6.23	$3\frac{1}{2}-4\frac{1}{2}$	—50434°	2546.034	A	100h	0.88	5.72	$3\frac{1}{2}-4\frac{1}{2}$	—46371°
2258.856	A	30	0.78	6.24	$3\frac{1}{2}-3\frac{1}{2}$	—50580°	2418.106	A	30	0.88	5.98	$3\frac{1}{2}-3\frac{1}{2}$	—48448°
2232.248	A	30	0.78	6.31	$3\frac{1}{2}-3\frac{1}{2}$	—51107°	*2377.983	A	30	0.88	6.07	$3\frac{1}{2}-2\frac{1}{2}$	—49146°
2195.744	A	25	0.78	6.40	$3\frac{1}{2}-3\frac{1}{2}$	—51852°	2377.275	A	25	0.88	6.07	$3\frac{1}{2}-4\frac{1}{2}$	—49158°
							2299.526	A	25	0.88	6.24	$3\frac{1}{2}-3\frac{1}{2}$	—50580°
2797.351	A	(40)	0.71	5.13	$2\frac{1}{2}-2\frac{1}{2}$	a^4F —41522°	2148.22	A	25	0.88	6.62	$3\frac{1}{2}-4\frac{1}{2}$	—53642°
2673.607	A	40	0.71	5.33	$2\frac{1}{2}-3\frac{1}{2}$	(3) —43176°	2125.44	A	25	0.88	6.68	$3\frac{1}{2}-3\frac{1}{2}$	—54140°
2671.838	A	50	0.71	5.33	$2\frac{1}{2}-1\frac{1}{2}$	—43200°	2085.74	A	30	0.88	6.79	$3\frac{1}{2}-4\frac{1}{2}$	—55035°
2644.186	A	35	0.71	5.38	$2\frac{1}{2}-3\frac{1}{2}$	—43592°							
2572.701	A	25	0.71	5.51	$2\frac{1}{2}-3\frac{1}{2}$	—44642°	2965.202	A	25h	1.22	5.38	$2\frac{1}{2}-3\frac{1}{2}$	b^4F —43592°
*2542.016	A	35	0.71	5.57	$2\frac{1}{2}-3\frac{1}{2}$	—45111°	2875.605	A	25	1.22	5.51	$2\frac{1}{2}-3\frac{1}{2}$	(7) —44642°
2537.225	A	35	0.71	5.58	$2\frac{1}{2}-2\frac{1}{2}$	—45185°	2533.131	A	100	1.22	6.09	$2\frac{1}{2}-1\frac{1}{2}$	—49342°
2394.326	A	30	0.71	5.87	$2\frac{1}{2}-2\frac{1}{2}$	—47537°	2360.730	A	40	1.22	6.45	$2\frac{1}{2}-3\frac{1}{2}$	—52224°
2356.552	A	40	0.71	5.95	$2\frac{1}{2}-2\frac{1}{2}$	—48206°	2281.907	A	25	1.22	6.63	$2\frac{1}{2}-3\frac{1}{2}$	—53687°
2343.176	A	40	0.71	5.98	$2\frac{1}{2}-3\frac{1}{2}$	—48448°							
2333.298	A	25	0.71	6.00	$2\frac{1}{2}-3\frac{1}{2}$	—48629°	2997.192	A	25	1.46	5.58	$1\frac{1}{2}-2\frac{1}{2}$	b^4F —45185°
2305.466	A	30	0.71	6.07	$2\frac{1}{2}-2\frac{1}{2}$	—49146°	2990.617	A	35	1.46	5.59	$1\frac{1}{2}-1\frac{1}{2}$	(8) —45259°
2295.084	A	40	0.71	6.09	$2\frac{1}{2}-1\frac{1}{2}$	—49342°	2962.994	A	25	1.46	5.63	$1\frac{1}{2}-2\frac{1}{2}$	—45570°
2255.810	A	25	0.71	6.18	$2\frac{1}{2}-1\frac{1}{2}$	—50100°							
2232.471	A	25	0.71	6.24	$2\frac{1}{2}-1\frac{1}{2}$	—50564°							
2231.657	A	25	0.71	6.24	$2\frac{1}{2}-3\frac{1}{2}$	—50580°	*2882.635	A	40	1.31	5.59	$1\frac{1}{2}-1\frac{1}{2}$	a^2P —45259°
2205.68	A	25	0.71	6.31	$2\frac{1}{2}-3\frac{1}{2}$	—51107°	2785.224	A	25	1.31	5.74	$1\frac{1}{2}-1\frac{1}{2}$	(9) —46471°
2083.22	A	25	0.71	6.64	$2\frac{1}{2}-3\frac{1}{2}$	—53771°	*2592.056	A	100	1.31	6.07	$1\frac{1}{2}-2\frac{1}{2}$	—49146°
							2529.474	A	25	1.31	6.18	$1\frac{1}{2}-1\frac{1}{2}$	—50100°
2996.078	A	50	0.50	4.62	$1\frac{1}{2}-2\frac{1}{2}$	a^4F —37446°							
2916.365	A	(60)	0.50	4.74	$1\frac{1}{2}-2\frac{1}{2}$	(4) —38358°							
2836.404	A	(60)	0.50	4.85	$1\frac{1}{2}-2\frac{1}{2}$	—39324°	2949.762	A	25	1.62	5.80	$3\frac{1}{2}-3\frac{1}{2}$	a^2F —46979°
2669.913	A	60	0.50	5.13	$1\frac{1}{2}-2\frac{1}{2}$	—41522°	2901.951	A	25	1.62	5.87	$3\frac{1}{2}-2\frac{1}{2}$	(10) —47537°
2617.781	A	25	0.50	5.22	$1\frac{1}{2}-2\frac{1}{2}$	—42267°	2839.158	A	25	1.62	5.96	$3\frac{1}{2}-4\frac{1}{2}$	—48299°
2555.347	A	25	0.50	5.33	$1\frac{1}{2}-1\frac{1}{2}$	—43200°	2676.828	A	35	1.62	6.23	$3\frac{1}{2}-4\frac{1}{2}$	—50434°
2467.302	A	40	0.50	5.51	$1\frac{1}{2}-2\frac{1}{2}$	—44596°							
2431.938	A	50	0.50	5.58	$1\frac{1}{2}-2\frac{1}{2}$	—45185°	2997.408	A	25	1.51	5.63	$2\frac{1}{2}-2\frac{1}{2}$	a^2D —45570°
2427.613	A	25	0.50	5.59	$1\frac{1}{2}-1\frac{1}{2}$	—45259°	2875.983	A	25	1.51	5.80	$2\frac{1}{2}-3\frac{1}{2}$	(11) —46979°
2413.310	A	25	0.50	5.62	$1\frac{1}{2}-0\frac{1}{2}$	—45503°							

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I P 8.9 Anal B List C September 1954

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B J. J. Livingood, *Phys. Rev.* **34**, 185 (1929). W L, I, T, I P

Pt I

Pt I

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Air							Air						
3064.69	A	(6R)	0.00	4.03	3-2	6s ³ D- 1°	3002.26	A	(4)	0.10	4.21	4-3	823- 3°
2929.79	A	(8R)	0.00	4.21	3-3	(1) - 3°	2897.89	A	(5)	0.10	4.36	4-3	(6) - 4°
2830.29	A	(8R)	0.00	4.36	3-3	- 4°	2719.02	A	(6R)	0.10	4.64	4-4	- 7°
2677.13	A	(5R)	0.00	4.61	3-2	- 6°	2705.88	A	(5R)	0.10	4.66	4-3	- 8°
2659.44‡	A	(10R)	0.00	4.64	3-4	- 7°	2650.84	A	(4R)	0.10	4.76	4-5	- 9°
2646.87	A	(6R)	0.00	4.66	3-3	- 8°							
2467.42	A	(6R)	0.00	5.00	3-2	-12°	2182.76	B	6	0.10	5.76	4-3	823-27°
							*2166.62	B	6	0.10	5.80	4-4	(7) -28°
2440.08	A	(4R)	0.00	5.06	3-3	6s ³ D-15°	2103.33	B	6	0.10	5.97	4-4	-30°
2234.91	B	8	0.00	5.52	3-3	(2) -22°	2084.62	B	7	0.10	6.02	4-3	-32°
2165.14	B	9	0.00	5.70	3-2	-24°	2062.81	B	5	0.10	6.08	4-3	-33°
2153.54	B	8	0.00	5.73	3-2	-25°							
2144.22	B	10	0.00	5.76	3-3	-27°	2803.22	A	(6)	0.76	5.16	0-1	5d ¹⁰ 1S -16°
2067.53	B	5	0.00	5.97	3-4	-30°	2698.40	A	(6)	0.76	5.33	0-1	(8) -18°
2049.38	B	6	0.00	6.02	3-3	-32°	2403.10	A	(4R)	0.76	5.89	0-1	-29°
							2639.33	A	(5)	0.81	5.49	2-2	6567-21°
3139.34	A	(7)	0.10	4.03	2-2	6s ³ D- 1°	2368.28	A	(4R)	0.81	6.02	2-3	(9) -32°
2997.97	A	(7R)	0.10	4.21	2-3	(3) - 3°	2244.93	B	8	0.81	6.31	2-3	-50°
2893.87	A	(6)	0.10	4.36	2-3	- 4°	2222.60	B	8	0.81	6.36	2-2	-38°
2771.65	A	(4R)	0.10	4.55	2-1	- 5°	2152.07	B	6	0.81	6.55	2-1	-42°
2733.96	A	(8R)	0.10	4.61	2-2	- 6°	2109.65	B	7	0.81	6.66	2-2	-43°
							2070.96	B	6	0.81	6.77	2-3	-44°
2702.38	A	(6R)	0.10	4.66	2-3	6s ³ D- 8°	2912.30	A	(4)	1.25	5.49	3-2	10116-21°
2628.02	A	(7R)	0.10	4.79	2-2	(4) -10°	2738.45	A	(8)	1.25	5.76	3-3	(10) -27°
*2487.15	A	(4R)	0.10	5.06	2-3	-15°	2713.09	A	(4)	1.25	5.80	3-4	-28°
2436.69	A	(4R)	0.10	5.16	2-1	-16°							
2357.09	A	(4R)	0.10	5.33	2-1	-18°	3251.97	A	(5)	1.25	5.05	1-0	6s ³ D-14°
							2773.99	A	(4)	1.25	5.70	1-2	(11) -24°
2202.20	B	8	0.10	5.70	2-2	6s ³ D-24°	2754.90	A	(5)	1.25	5.73	1-2	-25°
2190.16	B	6	0.10	5.73	2-2	(5) -25°	2753.85	A	(4)	1.25	5.73	1-0	-26°
2180.49	B	8	0.10	5.76	2-3	-27°	2658.16	A	(4)	1.25	5.89	1-1	-29°
2128.62	B	8	0.10	5.89	2-1	-29°	2217.33	B	7	1.25	6.82	1-2	-45°
2082.55	B	5	0.10	6.02	2-3	-32°							
							2893.26	A	(4)	1.91	6.18	2-1	15501-36°
							2733.67	A	(5R)	1.91	6.43	2-1	(12) -40°

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I P 18.48 Anal A List C August 1954

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- A A. G. Shenstone, Phil. Trans. Roy. Soc. London [A] 237, No. 782, 453 (1938). W L, I, T, I P

Pt II

Pt II

I A	Ref	Int	E P		J	Multiplet No.		I A	Ref	Int	E P		J	Multiplet No.
			Low	High							Low	High		
Vac 1621.658	A	50	0.00	7.61	2½-3½	5d ⁹ 2D -6p 4F° (1)		Vac 1402.236	A	50	0.00	8.80	2½-2½	5d ⁹ 2D -40° (6)
1530.190	A	50	0.00	8.07	2½-2½	5d ⁹ 2D -31°† (2)		1389.875	A	30	0.00	8.88	2½-2½	5d ⁹ 2D -41° (7)
1735.858	A	30	1.04	8.15	1½-1½	5d ⁹ 2D -33°† (3)		1369.362	A	30	0.00	9.02	2½-1½	5d ⁹ 2D -43° (8)
1505.240	A	50	0.00	8.20	2½-3½	5d ⁹ 2D -34° (4)		1305.305	A	30	0.00	9.46	2½-1½	5d ⁹ 2D -93° (9)
1429.524	A	50	0.00	8.64	2½-2½	5d ⁹ 2D -37° (5)		1436.309	A	50	1.04	9.63	1½-2½	5d ⁹ 2D -53°† (10)
								1380.475	A	30	1.04	9.98	1½-2½	5d ⁹ 2D -91° (11)

Pt II—Continued

Pt II—Continued

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Air 2144.244	A	100	0.59	6.35	$4\frac{1}{2}-3\frac{1}{2}$	$6s\ 4F\ -6p\ 4D^{\circ}\dagger$ (12)	Air 2616.759	A	30	2.90	7.61	$2\frac{1}{2}-3\frac{1}{2}$	$6s\ 2F\ -6p\ 4F^{\circ}\dagger$ (31)
Vac 1929.250	A	30	1.16	7.55	$3\frac{1}{2}-2\frac{1}{2}$		2190.315	A	30	2.23	7.87	$3\frac{1}{2}-3\frac{1}{2}$	$6s\ 2F\ -28^{\circ}\dagger$ (32)
Air 2310.957	A	50	1.65	6.99	$2\frac{1}{2}-1\frac{1}{2}$		2115.569	A	30	2.23	8.07	$3\frac{1}{2}-2\frac{1}{2}$	$6s\ 2F\ -31^{\circ}\dagger$ (33)
2377.276	A	50	1.16	6.35	$3\frac{1}{2}-3\frac{1}{2}$		Vac 1879.094	A	30	2.23	8.80	$3\frac{1}{2}-2\frac{1}{2}$	$6s\ 2F\ -40^{\circ}$ (34)
2625.338	A	30	1.65	6.35	$2\frac{1}{2}-3\frac{1}{2}$		1949.901	A	30	2.90	9.23	$2\frac{1}{2}-3\frac{1}{2}$	$6s\ 2F\ -48^{\circ}$ (35)
Vac 1777.086†	A	50R	0.59	7.54	$4\frac{1}{2}-5\frac{1}{2}$	$6s\ 4F\ -6p\ 4G^{\circ}\dagger$ (13)	1751.703	A	30	2.23	9.28	$3\frac{1}{2}-3\frac{1}{2}$	$6s\ 2F\ -49^{\circ}\dagger$ (36)
Air 2245.518	A	100	1.16	6.65	$3\frac{1}{2}-4\frac{1}{2}$		1248.600	A	40	2.23	12.12	$3\frac{1}{2}-2\frac{1}{2}$	$6s\ 2F\ -69^{\circ}$ (37)
2424.871	A	50	1.95	7.04	$1\frac{1}{2}-2\frac{1}{2}$		1704.765	A	30	2.95	10.19	$1\frac{1}{2}-0\frac{1}{2}$	$6s''\ 2D\ -57^{\circ}$ (38)
2036.461	A	100	0.59	6.65	$4\frac{1}{2}-4\frac{1}{2}$		Air 2774.772	A	50	3.07	7.52	$4\frac{1}{2}-4\frac{1}{2}$	$6s\ 4F\ -6p\ 4F^{\circ}\dagger$ (39)
2288.197	A	30	1.65	7.04	$2\frac{1}{2}-2\frac{1}{2}$		Vac 1509.288	A	50	4.28	12.46	$3\frac{1}{2}-3\frac{1}{2}$	$6s\ 4F\ -76^{\circ}\dagger$ (40)
Vac 1781.858	A	50	0.59	7.52	$4\frac{1}{2}-4\frac{1}{2}$	$6s\ 4F\ -6p\ 4F^{\circ}\dagger$ (14)	1499.380	A	30	4.28	12.51	$3\frac{1}{2}-2\frac{1}{2}$	$6s\ 4F\ -77^{\circ}\dagger$ (41)
1911.702	A	50	1.16	7.61	$3\frac{1}{2}-3\frac{1}{2}$		1494.724	A	30	4.28	12.54	$3\frac{1}{2}-3\frac{1}{2}$	$6s\ 4F\ -80^{\circ}$ (42)
1939.800	A	40	1.16	7.52	$3\frac{1}{2}-4\frac{1}{2}$		1482.823	A	100	4.28	12.60	$3\frac{1}{2}-4\frac{1}{2}$	$6s\ 4F\ -84^{\circ}$ (43)
1723.128	A	50	0.59	7.76	$4\frac{1}{2}-4\frac{1}{2}$	$6s\ 4F\ -27^{\circ}$ (15)	1524.725	A	30	4.68	12.77	$1\frac{1}{2}-2\frac{1}{2}$	$6s\ 4F\ -86^{\circ}\dagger$ (44)
1870.404	A	30	1.16	7.76	$3\frac{1}{2}-4\frac{1}{2}$		Air 2251.523	A	30	3.58	9.07	$3\frac{1}{2}-4\frac{1}{2}$	$6s''\ 2G\ -44^{\circ}\dagger$ (45)
1983.737	A	30	1.65	7.87	$2\frac{1}{2}-3\frac{1}{2}$	$6s\ 4F\ -28^{\circ}\dagger$ (16)	2251.918	A	30u	6.35	11.83	$3\frac{1}{2}-4\frac{1}{2}$	$6p\ 4D^{\circ} -7s\ 4F\dagger$ (46)
Air 2041.568	A	40	1.95	7.99	$1\frac{1}{2}-2\frac{1}{2}$	$6s\ 4F\ -30^{\circ}\dagger$ (17)	2822.270	A	30u	7.55	11.93	$2\frac{1}{2}-3\frac{1}{2}$	$6p\ 4D^{\circ} -8$ (47)
Vac 1883.051	A	40	1.65	8.20	$2\frac{1}{2}-3\frac{1}{2}$	$6s\ 4F\ -34^{\circ}\dagger$ (18)	2240.993	A	30u	6.99	12.49	$1\frac{1}{2}-2\frac{1}{2}$	$6p\ 4D^{\circ} -8$ (47)
1374.878	A	50	0.59	9.57	$4\frac{1}{2}-4\frac{1}{2}$	$6s\ 4F\ -52^{\circ}\dagger$ (19)	2877.520	A	100u	7.54	11.83	$5\frac{1}{2}-4\frac{1}{2}$	$6p\ 4G^{\circ} -7s\ 4F\dagger$ (48)
1349.161	A	30	0.59	9.74	$4\frac{1}{2}-4\frac{1}{2}$	$6s\ 4F\ -54^{\circ}\dagger$ (20)	2287.499	A	50u	7.54	12.93	$5\frac{1}{2}-6\frac{1}{2}$	$6p\ 4G^{\circ} -6d\ 4H\dagger$ (49)
1235.878	A	30	0.59	10.58	$4\frac{1}{2}-3\frac{1}{2}$	$6s\ 4F\ -61^{\circ}\dagger$ (21)	2271.718	A	30u	7.54	12.97	$5\frac{1}{2}-5\frac{1}{2}$	$6p\ 4G^{\circ} -6d\ 4G\dagger$ (50)
1077.078	A	30	0.59	12.05	$4\frac{1}{2}-3\frac{1}{2}$	$6s\ 4F\ -68^{\circ}\dagger$ (22)	2865.051	A	40u	7.52	11.83	$4\frac{1}{2}-4\frac{1}{2}$	$6p\ 4F^{\circ} -7s\ 4F\dagger$ (51)
1186.216	A	30	1.65	12.05	$2\frac{1}{2}-3\frac{1}{2}$		2860.678	A	80u	7.61	11.93	$3\frac{1}{2}-3\frac{1}{2}$	
1169.741	A	40	1.65	12.20	$2\frac{1}{2}-3\frac{1}{2}$	$6s\ 4F\ -70^{\circ}\dagger$ (23)	2799.981	A	40u	7.52	11.93	$4\frac{1}{2}-3\frac{1}{2}$	
1080.366	A	30	1.16	12.58	$3\frac{1}{2}-2\frac{1}{2}$	$6s\ 4F\ -83^{\circ}\dagger$ (24)	2202.577	A	50u	7.52	13.12	$4\frac{1}{2}-4\frac{1}{2}$	$6p\ 4F^{\circ} -6d\ 4F\dagger$ (52)
Air 2130.689	A	30	2.08	7.87	$2\frac{1}{2}-3\frac{1}{2}$	$6s'\ 4P\ -28^{\circ}$ (25)	2233.110	A	50u	7.61	13.14	$3\frac{1}{2}-3\frac{1}{2}$	
2014.925	A	40	2.08	8.20	$2\frac{1}{2}-3\frac{1}{2}$	$6s'\ 4P\ -34^{\circ}$ (26)	2875.849	A	40u	8.20	12.49	$3\frac{1}{2}-2\frac{1}{2}$	$34^{\circ} -8$ (53)
Vac 1867.122	A	30	2.08	8.69	$2\frac{1}{2}-2\frac{1}{2}$	$6s'\ 4P\ -39^{\circ}\dagger$ (27)							
1929.677	A	30	2.61	9.01	$1\frac{1}{2}-2\frac{1}{2}$	$6s'\ 4P\ -42^{\circ}$ (28)							
1168.282	A	40	2.08	12.64	$2\frac{1}{2}-2\frac{1}{2}$	$6s'\ 4P\ -85^{\circ}$ (29)							
Air 2794.213	A	100	2.23	6.65	$3\frac{1}{2}-4\frac{1}{2}$	$6s\ 2F\ -6p\ 4G^{\circ}\dagger$ (30)							

Strongest Unclassified Lines of Pt II

Vac 1889.516	A	50					Vac 1764.595	A	50				
1777.270	A	30					1506.279	A	30				

GOLD, $Z = 79$

Au I

I P 9.19 Anal A List C September 1954

REFERENCE

A J. R. Platt and R. A. Sawyer, Phys. Rev. 60, 866 (1941). W L, I, T, I P

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Au I

I A	Ref	Int	E P		J	Multiplet No.		I A	Ref	Int	E P		J	Multiplet No.
			Low	High							Low	High		
Air 2427.95† 2675.95	A A	(125) 50	0.00 0.00	5.08 4.61	$0\frac{1}{2}-1\frac{1}{2}$ $0\frac{1}{2}-0\frac{1}{2}$	$6s^2S$ (1)	$-6p^2P^\circ$	2590.04	A	15	2.65	7.41	$1\frac{1}{2}-0\frac{1}{2}$	$6s^2D$ $-7p^2P^\circ$ † (7)
2126.63 Vac	A	15	0.00	5.80	$0\frac{1}{2}-1\frac{1}{2}$	$6s^2S$ (2)	-5°	1714.57 Air	A	10	1.13	8.33	$2\frac{1}{2}-3\frac{1}{2}$	$6s^2D$ $-5f^2F^\circ$ (8)
1951.93 1942.31 1587.24	A A A	25 45 20	0.00 0.00 0.00	6.32 6.36 7.78	$0\frac{1}{2}-1\frac{1}{2}$ $0\frac{1}{2}-1\frac{1}{2}$ $0\frac{1}{2}-1\frac{1}{2}$		-8° -9° -20°	2170.75	A	20	2.65	8.33	$1\frac{1}{2}-2\frac{1}{2}$	
1646.59 1665.78	A A	20 12	0.00 0.00	7.50 7.41	$0\frac{1}{2}-1\frac{1}{2}$ $0\frac{1}{2}-0\frac{1}{2}$	$6s^2S$ (3)	$-7p^2P^\circ$	2940.68	A	25	4.61	8.81	$0\frac{1}{2}-1\frac{1}{2}$	$6p^2P^\circ$ $-9d^2D$ † (9)
		-----	-----	-----				2872.38	A	20	4.61	8.91	$0\frac{1}{2}-1\frac{1}{2}$	$6p^2P^\circ$ $-10d^2D$ † (10)
Air 2748.24 2700.90 2641.49 2387.75 2376.28	A A A A A	50 30 30 40 20	1.13 1.13 1.13 1.13 1.13	5.62 5.70 5.80 6.30 6.32	$2\frac{1}{2}-3\frac{1}{2}$ $2\frac{1}{2}-2\frac{1}{2}$ $2\frac{1}{2}-1\frac{1}{2}$ $2\frac{1}{2}-3\frac{1}{2}$ $2\frac{1}{2}-1\frac{1}{2}$	$6s^2D$ (4)	-2° -3° † -5° † -7° -8° †	2780.82	A	25	4.61	9.05	$0\frac{1}{2}-1\frac{1}{2}$	$6p^2P^\circ$ $-13d^2D$ † (11)
2352.58 2012.05 Vac	A A	50 15	1.13 1.13	6.38 7.26	$2\frac{1}{2}-2\frac{1}{2}$ $2\frac{1}{2}-1\frac{1}{2}$	$6s^2D$ (5)	-10° † -16°	2905.91 2873.42 2589.25	A A A	20 20 20	5.21 5.21 5.21	9.45 9.50 9.97	$2\frac{1}{2}-2\frac{1}{2}$ $2\frac{1}{2}-2\frac{1}{2}$ $2\frac{1}{2}-2\frac{1}{2}$	1° -6 (12) -11 $-15?$
1978.19 1919.64	A A	30 20	1.13 1.13	7.37 7.56	$2\frac{1}{2}-2\frac{1}{2}$ $2\frac{1}{2}-2\frac{1}{2}$		-17° -18° †			-----	-----	-----		
Air 2914.84 2883.45 2688.72	A A A	30 25 20	2.65 2.65 2.65	6.88 6.93 7.24	$1\frac{1}{2}-0\frac{1}{2}$ $1\frac{1}{2}-1\frac{1}{2}$ $1\frac{1}{2}-2\frac{1}{2}$	$6s^2D$ (6)	-13° -14° † -15° †	2815.34	A	15	5.70	10.08	$2\frac{1}{2}-1\frac{1}{2}$	3° -17 (13)

Au III

I P Anal C List C March 1961

REFERENCE

A L. Iglesias, J. Research Nat. Bur. Std. 64A, 481 (1960). T, C L, W L, I

Au III

Au III

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Vac 1040.650	A	100	0.00	11.86	$2\frac{1}{2}-2\frac{1}{2}$	$a^2D - z^4G^\circ \dagger$ (1)	Vac 1727.281 1935.416	A A	500 100	5.48 5.48	12.63 11.86	$2\frac{1}{2}-3\frac{1}{2}$ $2\frac{1}{2}-2\frac{1}{2}$	$a^4P - z^4G^\circ \dagger$ (14)
945.099	A	200	0.00	13.06	$2\frac{1}{2}-3\frac{1}{2}$	$a^2D - z^4F^\circ \dagger$ (2)	1821.169	A	400	6.10	12.88	$0\frac{1}{2}-0\frac{1}{2}$	$a^4P - z^9^\circ$ (15)
845.138	A	100	0.00	14.61	$2\frac{1}{2}-3\frac{1}{2}$	$a^2D - 25^\circ$ (3)	*1629.116 1589.559 1668.098	A A A	300d 200 100	5.48 6.17 6.10	13.06 13.93 13.50	$2\frac{1}{2}-3\frac{1}{2}$ $1\frac{1}{2}-2\frac{1}{2}$ $0\frac{1}{2}-1\frac{1}{2}$	$a^4P - z^4F^\circ$ (16)
843.454	A	100	0.00	14.64	$2\frac{1}{2}-1\frac{1}{2}$	$a^2D - 26^\circ \dagger$ (4)	1617.137 1776.396	A A	250 200	5.48 6.17	13.12 13.12	$2\frac{1}{2}-1\frac{1}{2}$ $1\frac{1}{2}-1\frac{1}{2}$	$a^4P - 12^\circ \dagger$ (17)
1693.917	A	1000	3.67	10.96	$4\frac{1}{2}-3\frac{1}{2}$	$a^4F - z^4D^\circ$ (5)	1584.074	A	150	5.48	13.28	$2\frac{1}{2}-2\frac{1}{2}$	$a^4P - 13^\circ \dagger$ (18)
1500.334	A	250	4.33	12.56	$3\frac{1}{2}-2\frac{1}{2}$								
1756.917	A	500	4.79	11.82	$2\frac{1}{2}-1\frac{1}{2}$								
1717.820	A	300	4.98	12.17	$1\frac{1}{2}-0\frac{1}{2}$								
1861.799	A	500	4.33	10.96	$3\frac{1}{2}-3\frac{1}{2}$		*1567.512	A	200	5.48	13.36	$2\frac{1}{2}-2\frac{1}{2}$	$a^4P - 14^\circ$ (19)
1589.680	A	80	4.79	12.56	$2\frac{1}{2}-2\frac{1}{2}$		1716.697	A	100	6.17	13.36	$1\frac{1}{2}-2\frac{1}{2}$	
1805.235	A	400	4.98	11.82	$1\frac{1}{2}-1\frac{1}{2}$		1502.441	A	200	5.48	13.70	$2\frac{1}{2}-3\frac{1}{2}$	$a^4P - 16^\circ$ (20)
*1629.116	A	300d	4.98	12.56	$1\frac{1}{2}-2\frac{1}{2}$								
1365.372	A	500	3.67	12.71	$4\frac{1}{2}-5\frac{1}{2}$	$a^4F - z^4G^\circ \dagger$ (6)	*1567.512	A	200	6.17	14.04	$1\frac{1}{2}-0\frac{1}{2}$	$a^4P - 19^\circ$ (21)
1775.166	A	800	4.33	11.28	$3\frac{1}{2}-4\frac{1}{2}$		1554.580	A	80	6.10	14.04	$0\frac{1}{2}-0\frac{1}{2}$	
1574.855	A	200	4.79	12.63	$2\frac{1}{2}-3\frac{1}{2}$								
1793.762	A	500	4.98	11.86	$1\frac{1}{2}-2\frac{1}{2}$		1409.472	A	225	5.48	14.24	$2\frac{1}{2}-2\frac{1}{2}$	$a^4P - 21^\circ \dagger$ (22)
1621.913	A	500	3.67	11.28	$4\frac{1}{2}-4\frac{1}{2}$								
1487.133	A	300	4.33	12.63	$3\frac{1}{2}-3\frac{1}{2}$								
1746.037	A	500	4.79	11.86	$2\frac{1}{2}-2\frac{1}{2}$		1391.441	A	180	5.48	14.36	$2\frac{1}{2}-3\frac{1}{2}$	$a^4P - 23^\circ$ (23)
1638.876	A	250	4.33	11.86	$3\frac{1}{2}-2\frac{1}{2}$								
1336.700	A	200	3.67	12.91	$4\frac{1}{2}-4\frac{1}{2}$	$a^4F - z^4F^\circ \dagger$ (7)	1379.951	A	150	5.48	14.43	$2\frac{1}{2}-1\frac{1}{2}$	$a^4P - 24^\circ \dagger$ (24)
1413.779	A	250	4.33	13.06	$3\frac{1}{2}-3\frac{1}{2}$								
1350.302	A	150	4.79	13.93	$2\frac{1}{2}-2\frac{1}{2}$								
1448.393	A	250	4.98	13.50	$1\frac{1}{2}-1\frac{1}{2}$		1348.873	A	100	5.48	14.64	$2\frac{1}{2}-1\frac{1}{2}$	$a^4P - 26^\circ$ (25)
1314.825	A	100	3.67	13.06	$4\frac{1}{2}-3\frac{1}{2}$		1446.701	A	80	6.10	14.64	$0\frac{1}{2}-1\frac{1}{2}$	
1285.302	A	50	4.33	13.93	$3\frac{1}{2}-2\frac{1}{2}$		1427.393	A	150	6.17	14.82	$1\frac{1}{2}-2\frac{1}{2}$	$a^4P - 27^\circ \dagger$ (26)
1417.111	A	100	4.79	13.50	$2\frac{1}{2}-1\frac{1}{2}$								
1439.100	A	300	4.33	12.91	$3\frac{1}{2}-4\frac{1}{2}$								
1378.655	A	150	4.98	13.93	$1\frac{1}{2}-2\frac{1}{2}$								
1454.927	A	250	4.79	13.28	$2\frac{1}{2}-2\frac{1}{2}$	$a^4F - 13^\circ$ (8)	1389.388	A	100	6.17	15.05	$1\frac{1}{2}-1\frac{1}{2}$	$a^4P - 29^\circ \dagger$ (27)
1487.906	A	250	4.98	13.28	$1\frac{1}{2}-2\frac{1}{2}$								
1367.149	A	200	4.33	13.36	$3\frac{1}{2}-2\frac{1}{2}$	$a^4F - 14^\circ$ (9)	1380.498	A	125	6.17	15.11	$1\frac{1}{2}-0\frac{1}{2}$	$a^4P - 30^\circ$ (28)
1473.279	A	80	4.98	13.36	$1\frac{1}{2}-2\frac{1}{2}$								
1385.763	A	300	4.79	13.70	$2\frac{1}{2}-3\frac{1}{2}$	$a^4F - 16^\circ \dagger$ (10)	1356.109	A	150	6.10	15.21	$0\frac{1}{2}-1\frac{1}{2}$	$a^4P - 32^\circ \dagger$ (29)
1239.961	A	100w	4.33	14.29	$3\frac{1}{2}-4\frac{1}{2}$	$a^4F - 22^\circ$ (11)							
1278.514	A	100	4.98	14.64	$1\frac{1}{2}-1\frac{1}{2}$	$a^4F - 26^\circ$ (12)	Air 2322.267 Vac 1786.106	A A	300 300	5.65 5.65	10.96 12.56	$3\frac{1}{2}-3\frac{1}{2}$ $3\frac{1}{2}-2\frac{1}{2}$	$a^2F - z^4D^\circ \dagger$ (30)
1932.038	A	100	6.17	12.56	$1\frac{1}{2}-2\frac{1}{2}$	$a^4P - z^4D^\circ \dagger$ (13)	Air 2188.966 Vac 1989.631 1767.415	A A A A	500 400 300	5.65 6.43 5.65	11.28 12.63 12.63	$3\frac{1}{2}-4\frac{1}{2}$ $2\frac{1}{2}-3\frac{1}{2}$ $3\frac{1}{2}-3\frac{1}{2}$	$a^2F - z^4G^\circ \dagger$ (31)
2159.085	A	100	6.10	11.82	$0\frac{1}{2}-1\frac{1}{2}$								
2184.108	A	100	6.17	11.82	$1\frac{1}{2}-1\frac{1}{2}$								
Vac 1948.792	A	200	5.48	11.82	$2\frac{1}{2}-1\frac{1}{2}$								

Au III—Continued

Au III—Continued

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Vac 1699.990 1664.778 1644.189 1489.446 1744.346	A A A A A	200 250 100 200 150	5.65 5.65 6.43 5.65 6.43	12.91 13.06 13.93 13.93 13.50	$3\frac{1}{2}-4\frac{1}{2}$ $3\frac{1}{2}-3\frac{1}{2}$ $2\frac{1}{2}-2\frac{1}{2}$ $3\frac{1}{2}-2\frac{1}{2}$ $2\frac{1}{2}-1\frac{1}{2}$	$a^2F - z^4F^{\circ}\dagger$ (32)	Vac 1395.971	A	180	6.68	15.53	$1\frac{1}{2}-1\frac{1}{2}$	$b^2D - 34^{\circ}\dagger$ (55)
1844.889	A	400	6.43	13.12	$2\frac{1}{2}-1\frac{1}{2}$	$a^2F - 12^{\circ}$ (33)	1414.247	A	100	7.93	16.66	$2\frac{1}{2}-2\frac{1}{2}$	$b^2D - 43^{\circ}$ (56)
1617.761 1801.982	A A	100 200	5.65 6.43	13.28 13.28	$3\frac{1}{2}-2\frac{1}{2}$ $2\frac{1}{2}-2\frac{1}{2}$	$a^2F - 13^{\circ}$ (34)	Air 3227.991 3309.856	A A	100 100	7.14 7.23	10.96 10.96	$4\frac{1}{2}-3\frac{1}{2}$ $3\frac{1}{2}-3\frac{1}{2}$	$a^2G - z^4D^{\circ}$ (57)
1600.496 1780.571	A A	200 100	5.65 6.43	13.36 13.36	$3\frac{1}{2}-2\frac{1}{2}$ $2\frac{1}{2}-2\frac{1}{2}$	$a^2F - 14^{\circ}$ (35)	2083.092	A	300	7.14	13.06	$4\frac{1}{2}-3\frac{1}{2}$	$a^2G - z^4F^{\circ}\dagger$ (58)
1697.081	A	150	6.43	13.70	$2\frac{1}{2}-3\frac{1}{2}$	$a^2F - 16^{\circ}$ (36)	Vac 1738.484 1761.947	A A	300 500	7.14 7.23	14.24 14.24	$4\frac{1}{2}-3\frac{1}{2}$ $3\frac{1}{2}-3\frac{1}{2}$	$a^2G - 20^{\circ}$ (59)
1436.088 1579.413	A A	80 200	5.65 6.43	14.24 14.24	$3\frac{1}{2}-2\frac{1}{2}$ $2\frac{1}{2}-2\frac{1}{2}$	$a^2F - 21^{\circ}$ (37)	1710.125	A	250	7.14	14.36	$4\frac{1}{2}-3\frac{1}{2}$	$a^2G - 23^{\circ}$ (60)
1428.907	A	300	5.65	14.29	$3\frac{1}{2}-4\frac{1}{2}$	$a^2F - 22^{\circ}$ (38)	1652.733 1673.919	A A	250 125	7.14 7.23	14.61 14.61	$4\frac{1}{2}-3\frac{1}{2}$ $3\frac{1}{2}-3\frac{1}{2}$	$a^2G - 25^{\circ}$ (61)
1417.368	A	125	5.65	14.36	$3\frac{1}{2}-3\frac{1}{2}$	$a^2F - 23^{\circ}\dagger$ (39)	1435.784	A	250	7.14	15.74	$4\frac{1}{2}-5\frac{1}{2}?$	$a^2G - 36^{\circ}$ (62)
1377.708	A	180	5.65	14.61	$3\frac{1}{2}-3\frac{1}{2}$	$a^2F - 25^{\circ}$ (40)	1430.037	A	250	7.23	15.86	$3\frac{1}{2}-2\frac{1}{2}$	$a^2G - 39^{\circ}$ (63)
1503.716	A	200	6.43	14.64	$2\frac{1}{2}-1\frac{1}{2}$	$a^2F - 26^{\circ}$ (41)	1381.338	A	200	7.23	16.17	$3\frac{1}{2}-3\frac{1}{2}$	$a^2G - 40^{\circ}\dagger$ (64)
1471.281	A	150	6.43	14.82	$2\frac{1}{2}-2\frac{1}{2}$	$a^2F - 27^{\circ}\dagger$ (42)	1341.660 1355.598	A A	180 150	7.14 7.23	16.34 16.34	$4\frac{1}{2}-4\frac{1}{2}$ $3\frac{1}{2}-4\frac{1}{2}$	$a^2G - 41^{\circ}$ (65)
1433.344	A	275	6.43	15.04	$2\frac{1}{2}-3\frac{1}{2}$	$a^2F - 28^{\circ}$ (43)	Air 2172.200	A	200	7.20	12.88	$0\frac{1}{2}-0\frac{1}{2}$	$a^2P - 9^{\circ}$ (66)
Air 2402.706	A	150	6.68	11.82	$1\frac{1}{2}-1\frac{1}{2}$	$b^2D - z^4D^{\circ}\dagger$ (44)	Vac 1958.472	A	100	7.20	13.50	$0\frac{1}{2}-1\frac{1}{2}$	$a^2P - z^4F^{\circ}\dagger$ (67)
2382.403	A	100	6.68	11.86	$1\frac{1}{2}-2\frac{1}{2}$	$b^2D - z^4G^{\circ}\dagger$ (45)	1996.853	A	150	7.86	14.04	$1\frac{1}{2}-0\frac{1}{2}$	$a^2P - 18^{\circ}$ (68)
2405.118 Vac 1702.235 1809.811	A A A	150 200 100	7.93 6.68 6.68	13.06 13.93 13.50	$2\frac{1}{2}-3\frac{1}{2}$ $1\frac{1}{2}-2\frac{1}{2}$ $1\frac{1}{2}-1\frac{1}{2}$	$b^2D - z^4F^{\circ}\dagger$ (46)	1707.508	A	100	7.20	14.43	$0\frac{1}{2}-1\frac{1}{2}$	$a^2P - 24^{\circ}$ (69)
1918.278	A	150	6.68	13.12	$1\frac{1}{2}-1\frac{1}{2}$	$b^2D - 12^{\circ}\dagger$ (47)	1774.419	A	100	7.86	14.82	$1\frac{1}{2}-2\frac{1}{2}$	$a^2P - 27^{\circ}$ (70)
1871.922	A	150	6.68	13.28	$1\frac{1}{2}-2\frac{1}{2}$	$b^2D - 13^{\circ}\dagger$ (48)	1698.970	A	200	7.86	15.13	$1\frac{1}{2}-2\frac{1}{2}$	$a^2P - 31^{\circ}$ (71)
1848.833	A	150	6.68	13.36	$1\frac{1}{2}-2\frac{1}{2}$	$b^2D - 14^{\circ}$ (49)	1541.978	A	100	7.20	15.21	$0\frac{1}{2}-1\frac{1}{2}$	$a^2P - 32^{\circ}$ (72)
1593.394	A	150	6.68	14.43	$1\frac{1}{2}-1\frac{1}{2}$	$b^2D - 24^{\circ}\dagger$ (50)	1481.066	A	150	7.20	15.54	$0\frac{1}{2}-0\frac{1}{2}$	$a^2P - 35^{\circ}\dagger$ (73)
1792.653	A	150	7.93	14.82	$2\frac{1}{2}-2\frac{1}{2}$	$b^2D - 27^{\circ}$ (51)	1446.334	A	150	7.20	15.74	$0\frac{1}{2}-1\frac{1}{2}$	$a^2P - 37^{\circ}$ (74)
1733.140 1474.707	A A	100d 100	7.93 6.68	15.05 15.05	$2\frac{1}{2}-1\frac{1}{2}$ $1\frac{1}{2}-1\frac{1}{2}$	$b^2D - 29^{\circ}$ (52)	1548.473	A	100	7.86	15.83	$1\frac{1}{2}-1\frac{1}{2}$	$a^2P - 38^{\circ}$ (75)
1464.692	A	100	6.68	15.11	$1\frac{1}{2}-0\frac{1}{2}$	$b^2D - 30^{\circ}$ (53)	1441.173	A	200	7.86	16.43	$1\frac{1}{2}-2\frac{1}{2}$	$a^2P - 42^{\circ}$ (76)
1715.670	A	200	7.93	15.13	$2\frac{1}{2}-2\frac{1}{2}$	$b^2D - 31^{\circ}\dagger$ (54)	1402.878	A	100	7.86	16.66	$1\frac{1}{2}-2\frac{1}{2}$	$a^2P - 43^{\circ}$ (77)

MERCURY, $Z = 80$

Hg I

I P 10.39 Anal A List C January 1959

REFERENCES

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 For additional references to analysis, see C. E. Moore, *Circ. Nat. Bur. Std.* **467**, Vol. III, 191 (1958).

Hg I

Hg I

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Air 2536.517	A	10R	0.00	4.87	0-1	$6s^2 \ ^1S - 6p \ ^3P^\circ$ (1)	Air 3021.498	A	5	5.44	9.52	2-3	$6p \ ^3P^\circ - 7d \ ^3D$ (8)
							2652.039	A	5	4.87	9.52	1-2	
							2534.764	A	4	4.65	9.52	0-1	
							3023.475	A	4	5.44	9.52	2-2	
Vac 1849.492†	P	(20R)	0.00	6.67	0-1	$6s^2 \ ^1S - 6p \ ^1P^\circ$ (2)	2653.679	A	4	4.87	9.52	1-1	
							3025.606	A	2	5.44	9.52	2-1	
1402.619	P	4	0.00	8.80	0-1	$6s^2 \ ^1S - 7p \ ^1P^\circ$ (3)	2925.410	A	4	5.44	9.66	2-1	$6p \ ^3P^\circ - 9s \ ^3S$ (9)
							2576.285	A	4	4.87	9.66	1-1	
							2464.057	A	3	4.65	9.66	0-1	
*1301.010	P	—	0.00	9.49	0-1	$6s^2 \ ^1S - 8p \ ^1P^\circ$ (4)	2563.855	A	1	4.87	9.68	1-0	$6p \ ^3P^\circ - 9s \ ^1S$ (10)
*1301.010	P	—	0.00	9.49	0-1	$6s^2 \ ^1S - 6p' \ ^1P^\circ$ (5)	2806.759	A	1	5.44	9.83	2-2	$6p \ ^3P^\circ - 8d \ ^1D$ (11)
							2483.815	A	3	4.87	9.83	1-2	
							2803.465	A	4	5.44	9.84	2-3	$6p \ ^3P^\circ - 8d \ ^3D$ (12)
Air 2856.935	A	3	4.87	9.19	1-0	$6p \ ^3P^\circ - 8s \ ^1S$ (6)	2481.996	A	4	4.87	9.84	1-2	
							2378.316	A	4	4.65	9.84	0-1	
							2804.434	A	2	5.44	9.84	2-2	
							2482.710	A	3	4.87	9.84	1-1	
3027.487	A	3	5.44	9.51	2-2	$6p \ ^3P^\circ - 7d \ ^1D$ (7)	2805.344	A	1	5.44	9.84	2-1	
2655.127	A	4	4.87	9.51	1-2								

Hg II

I P 18.676 Anal B List C October 1954

REFERENCES

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Hg II

Hg II

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Air [2814.93]	A	10	0.00	4.38	$0\frac{1}{2}-2\frac{1}{2}$	$6s^2\ ^2S - 6s^2\ ^2D$ (1)	Air 2916.27	A	10	6.24	10.47	$1\frac{1}{2}-2\frac{1}{2}$	$6s^2\ ^2D - 84834^\circ$ (6) $- 97094^\circ$ $- 108298^\circ$
							2148.003	A	7	6.24	11.99	$1\frac{1}{2}-2\frac{1}{2}$	
							Vac 1731.889	A	10	6.24	13.37	$1\frac{1}{2}-0\frac{1}{2}$	
Vac 1649.959†	A	30	0.00	7.48	$0\frac{1}{2}-1\frac{1}{2}$	$6s^2\ ^2S - 6p\ ^2P^\circ$							
1942.317	A	50	0.00	6.36	$0\frac{1}{2}-0\frac{1}{2}$	(2)							
893.107	A	10	0.00	13.82	$0\frac{1}{2}-1\frac{1}{2}$	$6s^2\ ^2S - 7p\ ^2P^\circ$	Air 2847.67	A	50	7.48	11.82	$1\frac{1}{2}-0\frac{1}{2}$	$6p\ ^2P^\circ - 7s\ ^2S$ (7)
923.393	A	4	0.00	13.37	$0\frac{1}{2}-0\frac{1}{2}$	(3)	2260.260	A	10	6.36	11.82	$0\frac{1}{2}-0\frac{1}{2}$	
							2224.710	A	20	7.48	13.03	$1\frac{1}{2}-2\frac{1}{2}$	$6p\ ^2P^\circ - 6d\ ^2D$ (8)
							Vac 1869.242	A	10	6.36	12.96	$0\frac{1}{2}-1\frac{1}{2}$	
Air 2262.233	A	9	4.38	9.84	$2\frac{1}{2}-2\frac{1}{2}$	$6s^2\ ^2D - 79704^\circ$	Air 2252.780	A	7	7.48	12.96	$1\frac{1}{2}-1\frac{1}{2}$	
2052.929	A	9	4.38	10.40	$2\frac{1}{2}-3\frac{1}{2}$	(4) $- 84209^\circ$							
2026.971	A	9	4.38	10.47	$2\frac{1}{2}-2\frac{1}{2}$	$- 84834^\circ$							
Vac 1414.427	A	9	4.38	13.11	$2\frac{1}{2}-3\frac{1}{2}$	$- 106213^\circ$							
1361.307	A	9	4.38	13.45	$2\frac{1}{2}-3\frac{1}{2}$	$6s^2\ ^2D - 108974^\circ$							
1331.759	A	10	4.38	13.65	$2\frac{1}{2}-1\frac{1}{2}$	(5) $- 110603^\circ$							
1321.733	A	10	4.38	13.72	$2\frac{1}{2}-3\frac{1}{2}$	$- 111172^\circ$							
1307.950	A	9	4.38	13.82	$2\frac{1}{2}-1\frac{1}{2}$	$- 111970^\circ$							

Hg III

I P 34 Anal C List C July 1961

REFERENCES

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Hg III

Hg III

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Vac *843.11 790.17 740.75	A A A	30 6 8	0.00 0.00 0.00	14.64 15.62 16.67	0-1 0-1 0-1	5d ¹⁰ 1S -118607° (1) -126556° -134998°	Air 2214.46 Vac 1662.72 1599.44 1467.33 1383.19 1305.60 *1280.80	A A A A A A A	20 40 50 25 25 30 30d	7.21 7.21 7.21 7.21 7.21 7.21 7.21	12.78 14.63 14.93 15.62 16.14 16.67 16.85	1-2 1-2 1-2 1-1 1-0 1-1 1-2	6s 3D -103549° (4) -118548° -120927° -126556° -130702° -134998° -136479°
1647.47 1592.93 1330.77 1321.04 *1280.80 1269.78 *843.11	A A A A A A A	60 30 40 30 30d 25 30	5.29 5.29 5.29 5.29 5.29 5.29 5.29	12.78 13.04 14.57 14.63 14.93 15.01 19.93	3-2 3-3 3-4 3-2 3-2 3-3 3-3	6s 3D -103549° (2) -105627° -117994° -118548° -120927° -121602° -161461°	Air 2354.238 2244.375 Vac 1740.27 *1738.50 1671.06 1652.45 1527.40 1360.46 1352.93 1326.36	A A A A A A A A A A A	75 75 40 75 40 20 40 40 40 20 25	7.54 7.54 7.54 7.54 7.54 7.54 7.54 7.54 7.54 7.54 7.54	12.78 13.04 14.63 14.64 14.93 15.01 15.62 16.61 16.67 16.85	2-2 2-3 2-2 2-1 2-2 2-1 2-3 2-1 2-1 2-2 2-2	6s 1D -103549° (5) -105627° -118548° -118607° -120927° -121602° -126556° -134588° -134998° -136479°
*1738.50 1677.90 1378.96 1377.83 1335.08 1323.22 1241.81 855.11 822.69 808.82	A A A A A A A A A A	75 50 40 40 40 30 15 15 15 15	5.68 5.68 5.68 5.68 5.68 5.68 5.68 5.68 5.68 5.68	12.78 13.04 14.63 14.64 14.93 15.01 15.62 20.12 20.69 20.95	2-2 2-3 2-2 2-1 2-2 2-3 2-1 2-2 2-3 2-3	6s 3D -103549° (3) -105627° -118548° -118607° -120927° -121602° -126556° -162972° -167580° -169666°	Air 2724.43 Vac 1727.04	B A	(70) 15	12.08 12.08	16.61 19.23	4-3 4-3	6s 3F -134588° (6) -155796°

LEAD, $Z = 82$

Pb I

I P 7.385 Anal A List C June 1955

REFERENCES

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Pb I

Pb I

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Air 2833.060	A	50000R	0.00	4.36	0-1	$6p^2\ ^3P-7s\ ^3P^\circ$ (1)	Air 2399.597 2237.443 2388.802	A A A	200h 1000r 200	1.31 0.97 1.31	6.46 6.48 6.48	2-2 1-1 2-1	$6p^2\ ^3P-7d\ ^3D^\circ$ (8)
2801.991 2657.094 2873.318	A A A	50000R 100 20000R	1.31 0.97 1.31	5.72 5.61 5.61	2-3 1-2 2-2	$6p^2\ ^3P-6d\ ^3F^\circ$ (2)	*2246.884 Vac 1904.76	A A	3000R 200R	0.97 0.00	6.46 6.48	1-2 0-1	
2088.41 2823.196 2613.652 2614.176 2169.994	A A A A A	500h 5000R 1000r 10000R 2000R	1.31 1.31 0.97 0.97 0.00	7.22 5.69 5.69 5.69 5.69	2-3 2-2 1-1 1-2 0-1	$6p^2\ ^3P-6d\ ^3D^\circ$ (3)	Air 2332.445 2189.62	A A	1000h 500rs?	1.31 0.97	6.61 6.60	2-1 1-0	$6p^2\ ^3P-9s\ ^3P^\circ\dagger$ (9)
2663.160 2476.379	A A	5000R 1500r	1.31 0.97	5.95 5.95	2-2 1-2	$6p^2\ ^3P-7s\ ^3P^\circ$ (4)	*2246.884 2253.947	A A	3000R 200H	1.31 1.31	6.81 6.79	2-3 2-2	$6p^2\ ^3P-8d\ ^3F^\circ\dagger$ (10)
2577.269 2401.949	A A	2000r 500r	1.31 0.97	6.10 6.10	2-1 1-1	$6p^2\ ^3P-7s\ ^1P^\circ\dagger$ (5)	2111.77 2115.04 Vac 1812.93	A A A	200h 1000r 200Rs	0.97 0.97 0.00	6.81 6.80 6.81	1-1 1-2 0-1	$6p^2\ ^3P-8d\ ^3D^\circ\dagger$ (11)
2628.28 2443.840 2446.188 2053.27	A A A A	300 600r 1000r 100R	1.31 0.97 0.97 0.00	6.01 6.02 6.01 6.01	2-1 1-0 1-1 0-1	$6p^2\ ^3P-8s\ ^3P^\circ$ (6)	Air 2175.60	A	1000rs	1.31	6.99	2-3	$6p^2\ ^3P-9d\ ^3F^\circ\dagger$ (12)
2393.792 2411.733	A A	5000R 500h	1.31 1.31	6.47 6.43	2-3 2-2	$6p^2\ ^3P-7d\ ^3F^\circ$ (7)	2697.514	A	500hs?	2.65	7.22	2-3	$6p^2\ ^1D-6d\ ^3D^\circ$ (13)

Pb II

I P 14.967 Anal A List C January 1955

REFERENCE

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Pb II

Pb II

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Vac							Vac						
1671.53	A	10	1.74	9.12	$1\frac{1}{2}-2\frac{1}{2}$	$6p^2P^\circ - 6p^2^4P$	1109.84	A	10	1.74	12.86	$1\frac{1}{2}-2\frac{1}{2}$	$6p^2P^\circ - 8d^2D$
1512.42	A	10	0.00	8.16	$0\frac{1}{2}-1\frac{1}{2}$	(1)	967.23	A	10	0.00	12.76	$0\frac{1}{2}-1\frac{1}{2}$	(9)
1921.66	A	7	1.74	8.16	$1\frac{1}{2}-1\frac{1}{2}$		1119.57	A	10	1.74	12.76	$1\frac{1}{2}-1\frac{1}{2}$	
1726.75†	A	20	0.00	7.15	$0\frac{1}{2}-0\frac{1}{2}$								
Air							1108.43	A	10	1.74	12.88	$1\frac{1}{2}-0\frac{1}{2}$	$6p^2P^\circ - 6p^2^2S$
2203.5	A	2	1.74	7.34	$1\frac{1}{2}-0\frac{1}{2}$	$6p^2P^\circ - 7s^2S$	958.76	A	2	0.00	12.88	$0\frac{1}{2}-0\frac{1}{2}$	(10)
Vac							1065.58	A	9	1.74	13.32	$1\frac{1}{2}-0\frac{1}{2}$	$6p^2P^\circ - 10s^2S$
1682.15	A	10	0.00	7.34	$0\frac{1}{2}-0\frac{1}{2}$	(2)	926.44	A	5	0.00	13.32	$0\frac{1}{2}-0\frac{1}{2}$	(11)
1822.03	A	10	1.74	8.51	$1\frac{1}{2}-2\frac{1}{2}$	$6p^2P^\circ - 6d^2D$	1049.82	A	10	1.74	13.50	$1\frac{1}{2}-2\frac{1}{2}$	$6p^2P^\circ - 9d^2D$
1433.96	A	10	0.00	8.61	$0\frac{1}{2}-1\frac{1}{2}$	(3)	1050.77	A	10	1.74	13.49	$1\frac{1}{2}-1\frac{1}{2}$	(12)
1796.68	A	10	1.74	8.61	$1\frac{1}{2}-1\frac{1}{2}$								
1335.20	A	10	1.74	10.98	$1\frac{1}{2}-2\frac{1}{2}$	$6p^2P^\circ - 6p^2^2D^\dagger$	1016.61	A	10	1.74	13.88	$1\frac{1}{2}-$	$6p^2P^\circ - 10d^2D$
1203.63	A	10	0.00	10.26	$0\frac{1}{2}-1\frac{1}{2}$	(4)	889.68	A	8	0.00	13.88	$0\frac{1}{2}-1\frac{1}{2}$	(13)
1103.94	A	10	1.74	12.92	$1\frac{1}{2}-1\frac{1}{2}$	$6p^2P^\circ - 6p^2^2P$	995.89	A	10	1.74	14.14	$1\frac{1}{2}-$	$6p^2P^\circ - 11d^2D$
1133.14	A	10	0.00	10.89	$0\frac{1}{2}-0\frac{1}{2}$	(5)	873.71	A	6	0.00	14.13	$0\frac{1}{2}-1\frac{1}{2}$	(14)
1348.37	A	10	1.74	10.89	$1\frac{1}{2}-0\frac{1}{2}$								
1331.65	A	10Hg?	1.74	11.01	$1\frac{1}{2}-0\frac{1}{2}$	$6p^2P^\circ - 8s^2S$	Air						
1121.36	A	10	0.00	11.01	$0\frac{1}{2}-0\frac{1}{2}$	(6)	2948.5	A	10	8.51	12.70	$2\frac{1}{2}-3\frac{1}{2}$	$6d^2D - 6f^2F^\circ^\dagger$
1231.20	A	10	1.74	11.77	$1\frac{1}{2}-2\frac{1}{2}$	$6p^2P^\circ - 7d^2D$	3016.4	A	10	8.61	12.70	$1\frac{1}{2}-2\frac{1}{2}$	(15)
1060.66	A	10	0.00	11.64	$0\frac{1}{2}-1\frac{1}{2}$	(7)	2526.7	A	8	8.51	13.40	$2\frac{1}{2}-3\frac{1}{2}$	$6d^2D - 7f^2F^\circ$
1145.91	A	4	1.74	12.51	$1\frac{1}{2}-0\frac{1}{2}$	$6p^2P^\circ - 9s^2S$	2576.6	A	8	8.61	13.40	$1\frac{1}{2}-2\frac{1}{2}$	(16)
986.71	A	10	0.00	12.51	$0\frac{1}{2}-0\frac{1}{2}$	(8)							

Pb III

I P 31.80 Anal B List C November 1954

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Pb III

Pb III

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Vac							Vac						
1553.1	B	20	0.00	7.95	0-1	$6s^2^1S - 6p^3P^\circ$	1406.48	A	12	9.75	18.53	2-1	$6p^3P^\circ - 7s^3S$
						(1)	1166.96	A	15	7.95	18.53	1-1	(4)
1048.89	A	(30)	0.00	7.95	0-1	$6s^2^1S - 6p^1P^\circ$	1114.99	A	9	7.46	18.53	0-1	
						(2)	1250.45	A	20	9.75	19.62	2-3	$6p^3P^\circ - 6d^3D$
							1069.12	A	20	7.95	19.50	1-2	(5)
1165.03	A	15	9.75	20.35	2-2	$6p^3P^\circ - 6p^2^3P$	1030.44	A	15	7.46	19.44	0-1	
1098.41	A	10	7.95	19.19	1-1	(3)	1266.78	A	15	9.75	19.50	2-2	
1308.10	A	15	9.75	19.19	2-1		1074.66	A	15	7.95	19.44	1-1	
1279.41	A	15	7.95	17.60	1-0		1274.53	A	10	9.75	19.44	2-1	
995.74	A	10	7.95	20.35	1-2								
1052.25	A	7	7.46	19.19	0-1								

BISMUTH, $Z = 83$

Bi I

I P 7.258 Anal B List D July 1955

REFERENCES

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Bi I

Bi I

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Air							Air						
2061.73	A	(9)	0.00	5.99	$1\frac{1}{2}-2\frac{1}{2}$	$6p^3\ ^4S^\circ-7s\ ^4P$	3024.62	B	20R	1.91	5.99	$2\frac{1}{2}-2\frac{1}{2}$	$6p^3\ ^2D^\circ-7s\ ^4P^\dagger$
2228.240	A	(9)	0.00	5.54	$1\frac{1}{2}-1\frac{1}{2}$	(1)	2989.03	B	40R	1.14	5.54	$1\frac{1}{2}-1\frac{1}{2}$	(5)
3067.732 $\dagger$	A	(10)	0.00	4.02	$1\frac{1}{2}-0\frac{1}{2}$		2696.75	B	2	1.14	5.99	$1\frac{1}{2}-2\frac{1}{2}$	
2230.626	A	(10)	0.00	5.53	$1\frac{1}{2}-2\frac{1}{2}$	$6p^3\ ^4S^\circ-6d\ ^2D$	2993.33	B	30R	1.14	5.53	$1\frac{1}{2}-2\frac{1}{2}$	$6p^3\ ^2D^\circ-6d\ ^2D^\dagger$
2276.578	A	(5)	0.00	5.42	$1\frac{1}{2}-1\frac{1}{2}$	(2)							(6)
2020.99	A	(2)	0.00	6.11	$1\frac{1}{2}-1\frac{1}{2}$	$6p^3\ ^4S^\circ-7s\ ^2P?$	2938.24	B	50R	1.91	6.11	$2\frac{1}{2}-1\frac{1}{2}$	$6p^3\ ^2D^\circ-7s\ ^2P?$
2177.33	A	(2)	0.00	5.67	$1\frac{1}{2}-0\frac{1}{2}$	(3)	2897.98	B	50R	1.14	5.67	$1\frac{1}{2}-0\frac{1}{2}$	(7)
2110.263	A	(6)	0.00	5.85	$1\frac{1}{2}-0\frac{1}{2}$	$6p^3\ ^4S^\circ-8s\ ^4P^\dagger$	2627.91	B	30R	1.14	6.11	$1\frac{1}{2}-1\frac{1}{2}$	
			-----	-----		(4)							

Bi II

I P 16.62 Anal C List C February 1955

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 B M. F. Crawford, Proc. Roy. Soc. [A] **143**, 548 (1934). W L, I, T, I P
 C R. V. Zumstein, Phys. Rev. **38**, 2214 (1931). W L
 * and §=Blend of Bi II and Bi III

Bi II

Bi II

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Vac 1436.83 1241.05	A A	(20) (10)	0.00 0.00	8.59 9.95	0-1 0-1	1 - 2° (1) - 6°	Air 2803.4 2368.1 2214.0 *2068.9§ Vac 1823.71 1787.39 1652.81 1609.70 1536.77 1502.50 1462.14 1447.94 1350.07 1329.47	B B B B B B A A B A	15 16 40b 45b 70 60 20 40 30 20 25 25 20 20	4.19 4.19 4.19 4.19 4.19 4.19 4.19 4.19 4.19 4.19 4.19 4.19	8.59 9.40 9.76 10.15 10.96 11.10 11.66 11.86 12.22 12.41 12.63 12.72 13.33 13.48	2-1 2-2 2-2 2-3 2-2 2-1 2-1 2-3 2-2 2-1 2-2 2-3 2-3 2-2	4 - 2° (4) - 4° - 5° - 8° - 9° -10° -11° -13° -14° -15° -18° -19° -22° -24°
1791.82 1777.01 1591.79 1520.57 1486.93 1455.11 1325.46	C C B B A A A	70 80 60B 40 35 50 20	1.64 1.64 1.64 1.64 1.64 1.64 1.64	8.53 8.59 9.40 9.76 9.95 10.13 10.96	1-0 1-1 1-2 1-2 1-1 1-2 1-2	2 - 1° (2) - 2° - 4° - 5° - 6° - 7° - 9°	1902.33‡ *1691.5 § 1611.38 1573.70 1538.06 1533.17 1393.92 1372.61 1085.47	C B B B B B A A A	100b 20b 40 40 35 40 20 25 20	2.10 2.10 2.10 2.10 2.10 2.10 2.10 2.10 2.10	8.59 9.40 9.76 9.95 10.13 10.15 10.96 11.10 13.48	2-1 2-2 2-2 2-1 2-2 2-3 2-2 2-1 2-2	3 - 2° (3) - 4° - 5° - 6° - 7° - 8° - 9° -10° -24°
							Air 2186.9 Vac 1989.35 1749.29 1601.58 1563.67 Air 2544.5 2713.3 2950.4	B B B B B B B B B B	60 25 20 25 20 20B 20 20	5.45 5.45 5.45 5.45 5.45 8.59 9.76 10.13	11.10 11.66 12.51 13.16 13.35 13.44 14.31 14.31	0-1 0-1 0-1 0-1 0-1 1-2 2-3 2-3	5 -10° (5) -11° -16° -21° -23° 2°-22 (6) 5°-23 (7) 7°-23 (8)

Bi III

I P 25.45 Anal C List C January 1955

REFERENCES

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 B G. Arvidsson, Ann. der Phys. [5] 12, 802 (1932). W L, (I)

Bi III

Bi III

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Vac 1461.00 1606.40 1423.516 1423.333	B A B B	60b 60b 35 35	2.57 2.57 0.00 0.00	11.02 10.25 8.67 8.67	1½-2½ 1½-1½ 0½-0½ 0½-0½	6p 2P° - 6p² 4P† (1)	Vac 1045.76 920.93 1139.015 Air 2855.6 2414.6 2847.4	B B B A A A A	50b (7) 20 80B 75b 30B	2.57 0.00 2.57 12.65 11.87 12.65	14.37 13.40 13.40 16.97 16.98 16.98	1½-2½ 0½-1½ 1½-1½ 2½-3½ 1½-2½ 2½-2½	6p 2P° - 6p² 2D (4) 6d 2D - 5f 2F° (5)
2021.15 2020.75	A A	20 20	2.57 2.57	8.67 8.67	1½-0½ 1½-0½		2213.55 Vac 1988.26	A A	30 10	15.08 14.44	20.65 20.65	1½-0½ 0½-0½	7p 2P° - 9s 2S (6)
Vac 1346.12 1051.810 1224.64 1039.99 1326.84	B B B B B	60 30 50 25 40	2.57 0.00 2.57 0.00 2.57	11.74 11.74 12.65 11.87 11.87	1½-0½ 0½-0½ 1½-2½ 0½-1½ 1½-1½	6p 2P° - 7s 2S (2) 6p 2P° - 6d 2D (3)							

POLONIUM, $Z = 84$

Po I

I P 8.39 Anal C List C September 1956

REFERENCES

- A G. W. Charles, D. J. Hunt, G. Pish, and D. L. Timma, J. Opt. Soc. Am. **45**, 869 (1955). W L, I, T, I P
S. Mrozowski, J. Opt. Soc. Am. **46**, 663 (1956). T

Po I

Po I

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Air 2558.01	A	1500w	0.00	4.82	2-2	$6p^4\ ^3P - 7s\ ^5S^\circ \dagger$ (1)	Air 2534.95 2050.48	A A	300 100	2.08 0.93	7.19 7.19	1-1 0-1	$6p^4\ ^3P - 8s\ ^5S^\circ ?$ (5)
2450.11 $\dagger$ 3003.21	A A	1500w 2500w	0.00 0.93	5.04 5.04	2-1 0-1	$6p^4\ ^3P - 7s\ ^5S^\circ \dagger$ (2)	2958.90 2490.56	A A	600 700	2.68 2.68	6.85 7.63	2-2 2-	$6p^4\ ^1D - 6^\circ$ (6) -13°
2800.24 2761.91 2587.63 2483.97	A A A A	400 600 400 700	2.08 2.08 2.08 2.08	6.49 6.55 6.85 7.05	1-1 1-2 1-2 1-1	$6p^4\ ^3P - 3^\circ$ (3) $- 4^\circ$ $- 6^\circ$ $- 9^\circ$	2919.31	A	400	2.68	6.90	2-2	$6p^4\ ^1D - 8s\ ^5S^\circ ?$ (7)
2557.33	A	300	2.08	6.90	1-2	$6p^4\ ^3P - 8s\ ^5S^\circ ?$ (4)	Strongest Unclassified Lines of Po I						
							Air 2663.33 2562.31	A A	700h 400				

RADON, $Z = 86$

Rn I

I P 10.702 Anal A List A February 1955

REFERENCES

- A E. Rasmussen, Zeit. Phys. 62, 507 (1930); 80, 726 (1933). W L, T, I P
 B. Edlén, Ark. Mat. Astr. Fys. (Stockholm) 29A, No. 21 (1943). T

Rn I

I A	Ref	Int	E P		J	Multiplet No.
			Low	High		
Vac						
1786.07†	A	—	0.00	6.91	0—1	$6p^6\ ^1S - 7s\ [1\frac{1}{2}]^{\circ}$
1451.56	A	—	0.00	8.50	0—1	(1) $-6d\ [0\frac{1}{2}]^{\circ}$

RADIUM, $Z = 88$

Ra I

I P 5.256 Anal A List A March 1955

REFERENCES

- A E. Rasmussen, See H. N. Russell, Phys. Rev. **46**, 989 (1934). W L, I, T, I P
 E. Rasmussen, Zeit. Phys. **87**, 607 (1934). T, I P

Ra I

I A	Ref	Int	E P		J	Multiplet No.
			Low	High		
Air 2955.65	A	—	0.00	4.18	0-1	$7s^2\ ^1S - 7p'\ ^3P^\circ$ (1)

Ra II

I P 10.103 Anal A List B March 1955

REFERENCE

- A E. Rasmussen, Zeit. Phys. **86**, 24 (1933). W L, I, T, I P

Ra II

Ra II

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Vac 1908.7	A	8	0.00	6.47	$0\frac{1}{2} - 1\frac{1}{2}$	$7s\ ^2S - 8p\ ^2P^\circ$	Air 3033.44	A	10	3.24	7.30	$1\frac{1}{2} - 0\frac{1}{2}$	$7p\ ^2P^\circ - 9s\ ^2S$
1976.0	A	2	0.00	6.25	$0\frac{1}{2} - 0\frac{1}{2}$	(1)	2643.73	A	10	2.64	7.30	$0\frac{1}{2} - 0\frac{1}{2}$	(6)
Air 2813.76	A	30	1.70	6.08	$2\frac{1}{2} - 3\frac{1}{2}$	$6d\ ^2D - 5f\ ^2F^\circ$	2795.21	A	10	3.24	7.65	$1\frac{1}{2} - 2\frac{1}{2}$	$7p\ ^2P^\circ - 8d\ ^2D$
2708.96	A	20	1.49	6.05	$1\frac{1}{2} - 2\frac{1}{2}$	(2)	2475.50	A	10	2.64	7.62	$0\frac{1}{2} - 1\frac{1}{2}$	(7)
2836.46	A	6	1.70	6.05	$2\frac{1}{2} - 2\frac{1}{2}$		2460.55	A	8	3.24	8.25	$1\frac{1}{2} - 0\frac{1}{2}$	$7p\ ^2P^\circ - 10s\ ^2S$
2586.61	A	8	1.70	6.47	$2\frac{1}{2} - 1\frac{1}{2}$	$6d\ ^2D - 8p\ ^2P^\circ$	2197.8	A	2	2.64	8.25	$0\frac{1}{2} - 0\frac{1}{2}$	(8)
2595.15	A	2	1.49	6.25	$1\frac{1}{2} - 0\frac{1}{2}$	(3)	2369.73	A	8	3.24	8.44	$1\frac{1}{2} - 2\frac{1}{2}$	$7p\ ^2P^\circ - 9d\ ^2D^\dagger$
2480.11	A	4	1.49	6.47	$1\frac{1}{2} - 1\frac{1}{2}$		2131.0	A	5	2.64	8.43	$0\frac{1}{2} - 1\frac{1}{2}$	(9)
2169.9	A	10	1.70	7.38	$2\frac{1}{2} - 3\frac{1}{2}$	$6d\ ^2D - 6f\ ^2F^\circ$	2177.3	A	4	3.24	8.90	$1\frac{1}{2} - 2\frac{1}{2}$	$7p\ ^2P^\circ - 10d\ ^2D^\dagger$
2107.6	A	4	1.49	7.35	$1\frac{1}{2} - 2\frac{1}{2}$	(4)	Vac 1972.6	A	4	2.64	8.89	$0\frac{1}{2} - 1\frac{1}{2}$	(10)
Vac 1888.7	A	5	1.70	8.23	$2\frac{1}{2} - 3\frac{1}{2}$	$6d\ ^2D - 7f\ ^2F^\circ$							
						(5)							

Selected Publications of the National Bureau of Standards

Atomic Energy Levels, C. E. Moore:

Circular 467, Volume I. H to V ($Z=1$ to 23) 206 spectra. 309 p. (1949)	\$5. 50
Circular 467, Volume II. Cr to Nb ($Z=24$ to 41) 152 spectra. 227 p. (1952)	\$4. 00
Circular 467, Volume III. $\left. \begin{array}{l} \text{Mo to La } (Z=42 \text{ to } 57) \\ \text{Hf to Ac } (Z=72 \text{ to } 89) \end{array} \right\}$ 124 spectra. 245 p. (1958)	\$2. 50

An Ultraviolet Multiplet Table, C. E. Moore:

Circular 488, Section 1. H to V ($Z=1$ to 23); Selected Multiplets of 79 Spectra. 78 p. (1950).	\$0. 55
Circular 488, Section 2. Cr to Nb ($Z=24$ to 41); Selected Multiplets of 46 Spectra. 115 p. (1952).	\$0. 70
Circular 488, Section 3. $\left\{ \begin{array}{l} \text{Mo to La } (Z=42 \text{ to } 57) \\ \text{Hf to Ra } (Z=72 \text{ to } 88) \end{array} \right\}$ Selected Multiplets of 78 Spectra. 94 p. (1961).	\$0. 60
Circular 488, Section 4. H to Nb ($Z=1$ to 41); Finding List for Sections 1 and 2 of the Table. 65 p. (1961).	\$0. 45
Circular 488, Section 5. $\left\{ \begin{array}{l} \text{Mo to La } (Z=42 \text{ to } 57) \\ \text{Hf to Ra } (Z=72 \text{ to } 88) \end{array} \right\}$ Finding List for Section 3 of the Table. 30 p. (1961).	\$0. 30

Table of Wavenumbers, C. D. Coleman, W. R. Bozman, and W. F. Meggers:

Monograph 3, Volume I. 2000 Å to 7000 Å. 508 p. (1960)	\$6. 00
Monograph 3, Volume II. 7000 Å to 1000 μ . 542 p. (1960)	\$6. 00

New Description of Thorium Spectra, Romuald Zalubas:

Monograph 17, 106 p. (1960)	\$0. 65
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Tables of Spectral-Line Intensities, W. F. Meggers, C. H. Corliss, and B. F. Scribner:

Monograph 32, Part I. Arranged by Elements. 474 p. (1961)	\$4. 00
Monograph 32, Part II. Arranged by Wavelengths. 272 p. (1961)	\$3. 00

The above publications may be purchased from the Superintendent of Documents, U.S. Government
Printing Office, Washington 25, D.C.

A Multiplet Table of Astrophysical Interest, C. E. Moore. A Reprinting of the 1945 Multiplet Table (Princeton Univ., Obs. Contr. No. 20):

Technical Note 36 (PB151395), Part I Table of Multiplets, and Part II Finding List, $\lambda\lambda 2951\text{\AA}$ – $13164\text{\AA}$. 242 p. (1959).	\$4. 00
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The above Technical Note may be purchased by the PB number from the Department of Commerce,
Office of Technical Services, Washington 25, D.C.

